

2012 ANNUAL REPORT OF THE INTERAGENCY BISON MANAGEMENT PLAN

1 November 2011 - 31 October 2012



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Annual Report Overview

This report, which covers November 1, 2011 to October 31, 2012, summarizes progress under the Adaptive Management Plan of the Interagency Bison Management Plan (IBMP). The report initially describes events leading up to the creation of the IBMP, next presents highlights for the past year, then details specific activities under the current IBMP adaptive management plan. Monitoring data and/or narrative summaries are provided for each management action taken under the adaptive management plan, using the framework of that plan as the outline for this report. Additionally, the report includes summaries of work started under Partner-accepted recommendations made by a Citizens' Working Group in November 2011.

Agencies involved with the IBMP include the Animal and Plant Health Inspection Service (APHIS); Confederated Salish and Kootenai Tribes (CSKT); Inter Tribal Buffalo Council (ITBC); Montana Fish, Wildlife, and Parks (MFWP); Montana Department of Livestock (MDOL); National Park Service (NPS); Nez Perce Tribe (NPT); and U.S. Forest Service (USFS).

Annual reports are used by the IBMP agencies to (a) document the effects and effectiveness of management actions taken to meet IBMP goals, and (b) adjust management actions for the following year, as appropriate, to better meet those goals. The annual report is *not* intended to provide a summary of *all* actions of the IBMP agencies for the preceding year. Instead, the website www.ibmp.info is the agencies' repository for meeting notes, key science reports, and other relevant activities.

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List of Abbreviations

- ☐ AM—Adaptive management
- ☐ APHIS—Animal and Plant Health Inspection Service
- ☐ CSKT—Confederated Salish Kootenai Tribes
- ☐ CWG—Citizens' Working Group
- ☐ DSA—Designated Surveillance Zone
- ☐ EA—Environmental Assessment
- ☐ EIS—Environmental Impact Statement
- ☐ GAO—Government Accountability Office
- ☐ GNF—Gallatin National Forest
- ☐ IBMP—Interagency Bison Management Plan
- ☐ ITBC— Inter Tribal Buffalo Council
- ☐ MDOL—Montana Department of Livestock
- ☐ MDOT—Montana Department of Transportation
- ☐ MEPA—Montana Environmental Policy Act
- ☐ MFWP—Montana Fish Wildlife and Parks
- ☐ MOU—Memorandum of Understanding
- ☐ MSU—Montana State University
- ☐ NEPA—National Environmental Policy Act
- ☐ NGO—Non-governmental organizations
- ☐ NPT—Nez Perce Tribe
- ☐ NPS—National Park Service
- ☐ Park or park—Yellowstone National Park
- ☐ ROD—Record of Decision
- ☐ SWE—snow water equivalent
- ☐ USDA—United States Department of Agriculture
- ☐ USDI—United States Department of Interior
- ☐ USFWS—United States Fish and Wildlife Service
- ☐ YELL—Yellowstone National Park
- ☐ YNP—Yellowstone National Park

Background

Since the mid-1980s, increasing numbers of bison have moved to low-elevation winter ranges outside the northern and western parts of Yellowstone National Park (YELL) in response to accumulating snow pack (Gates et al. 2005) and increased population size. These movements led to an enduring series of societal conflicts among various public and management entities regarding bison abundance and the potential transmission of brucellosis to domestic cattle with widespread economic repercussions (Cheville et al. 1998). Thus, the federal government and State of Montana agreed to an Interagency Bison Management Plan that established guidelines for managing the risk of brucellosis transmission from bison to cattle by implementing hazing, test-and-slaughter, hunting, and other actions near the park boundary (USDI and USDA 2000a). This plan identified the need to conserve bison and established conservation zones encompassing approximately 250,000 acres of the northern two-thirds of YELL and a small portion of the adjacent Gallatin National Forest.

Since the Record of Decision (ROD) was signed for the IBMP in 2000 (USDI and USDA 2000b), the signatories continue to collect new information regarding bison, brucellosis, and the management of disease risk and suppression. However, progress has been slow in completing the plan's three adaptive management steps. As a result, the federal government and State of Montana were criticized for (1) not clearly defining measurable objectives to express desired outcomes; and (2) not systematically applying adaptive management principles, including defining specific scientific and management questions to be answered, conducting specific activities to answer them, and incorporating findings into the IBMP (U.S. Government Accountability Office 2008). Thus, there was a need to develop specific management objectives, conduct surveillance to evaluate the effects and effectiveness of management actions, and develop methods for informing stakeholders and adjusting the IBMP based on these assessments.

To address these needs, the IBMP agencies met several times in public venues during August-December 2008 to deliberate on recommendations by the U.S. Government Accountability Office, assess the effectiveness and outcomes of IBMP management activities, and, considering prevailing conditions, develop and incorporate short- and long-term adaptive management adjustments to the IBMP for the winter of 2008-2009 and beyond (USDI et al. 2008). These adjustments were based on the adaptive management framework and principles outlined in the U.S. Department of Interior's Technical Guide on Adaptive Management (Williams et al. 2007).

2011/2012 Highlights

- **Meetings.**—The IBMP agencies met four times in Montana between November 1, 2011 and October 31, 2012: November 30 and December 1, 2011 in Chico Hot Springs; February 24, 2012 in Bozeman; May 1 and 2 in Bozeman; and August 30 in West Yellowstone. Full reports summarizing each meeting can be found at www.ibmp.info. In addition, numerous teleconferences and subcommittee meetings were held.
- **Field trip.**—Partners, staff, and the general public met with landowners in the Taylor Fork drainage outside the northwest corner of Yellowstone National Park on August 29, 2012. The goals of the field trip were to (1) better assess and understand “on-the-ground” issues associated with allowing increased bison tolerance to this area, and (2) meet with landowners to discuss their concerns regarding increasing bison tolerance into landscapes that include their properties.
- **Adaptive management changes.**—The IBMP agencies developed a list of 33 possible adaptive management (AM) recommendations during autumn 2010. In May 2011, the list was shortened due to lack of consensus on some recommendations (the list was originally called “2010 AM changes”, but is now called “2011 AM changes”). The 2011 AM changes were approved in two separate documents—one describing increased tolerance for bison north of Yellowstone National Park, and another describing the remaining adjustments—since the former had to undergo a State of Montana environmental analysis before reaching a decision.
 - Signing of 2011 AM changes: Signing of those AM changes *not* associated with increase tolerance north of the Park was completed at the November 2011 meeting, with the exception of the State Veterinarian who signed at a later date. Separately, the State Veterinarian requested an additional two AM monitoring changes, which were signed off by all Partners during the August 2012 meeting.
 - New tolerance area north of YELL: The IBMP Partners negotiated an area of increased tolerance for bison in mid-March 2011. The enlarged conservation area encompasses the north end of the

Gardner Basin on both sides of the Yellowstone River, but does not extend any farther north than Yankee Jim Canyon. Partners signed this adaptive management change pending the outcome of a State of Montana environmental assessment; based on that assessment MDOL and MFWP ratified the change in late February 2012. Two lawsuits were filed against the State of Montana in objection to the increased area for tolerance—one from Park County and one from the Park County Stockgrowers Association. These lawsuits are ongoing.

- Possible new tolerance area for bison west of YELL: Based in part on the recommendation from a Citizens' Working Group (see below), the IBMP Partners are considering an adaptive management change to allow an area of increased tolerance for Yellowstone bison in the Hebgen Basin and to the west and northwest of YELL. A State of Montana environmental assessment is underway and expected to be completed in 2012.
- **Transfer of quarantined bison.**—The Partners discussed possible processes, methods, and challenges for transferring bison to American Indian tribes, federal and state lands, and private entities. In spring 2012, the NPS made an offer to the CSKT, NPT, ITBC, and the Ft Belknap Indian Community to send each group bison that would otherwise be shipped to slaughter. In September 2012, the NPS signed an agreement with the ITBC that sets forth the roles and responsibilities of the parties regarding the transfer of bison from Yellowstone National Park to the ITBC for transport directly to slaughter facilities and subsequent distribution of meat, hides, horns, and other bison parts to support the nutrition and culture of American Indian tribes. In addition, more than 60 Yellowstone bison proven brucellosis free during quarantine were transferred to the Fort Peck Indian Reservation in March 2012.
- **Remote vaccination.**—In May 2010, the NPS released a draft environmental impact statement (EIS) regarding whether to vaccinate free-ranging bison inside YELL for brucellosis using a rifle-delivered bullet with a vaccine payload. The NPS received more than 9,000 comments about multiple issues associated with remote vaccination, including (a) the low likelihood of success in substantially reducing brucellosis prevalence in bison, (b) high and perpetual costs of implementation, (c) undesirable behavioral impacts to bison, and (d) reduced wildlife viewing opportunities for visitors. To develop a lasting solution, the Superintendent of YELL is seeking independent professional advice regarding whether substantial brucellosis suppression is feasible and sustainable without significantly affecting bison behavior or visitor experience. A brucellosis science workshop, co-chaired by a representative from the State of Montana, is being organized for early 2013 to integrate science into a brucellosis management program that considers all stakeholder perspectives. It will be the task of expert panelists to provide recommendations on how brucellosis prevalence in Yellowstone bison may be reduced, as well as to identify critical knowledge gaps and research priorities that could improve brucellosis management practices. Release of the final EIS is on hold until this advice is received and evaluated.
- **Bison hunt.**—Public and treaty hunts continued for bison that migrated from summer ranges in YELL to lower elevation winter ranges in Montana. Due to low snow pack, few bison migrated outside YELL during early to mid-winter, and as a result, few bison were harvested. The IBMP Partners reiterated their commitment to use public and tribal hunting in Montana as the primary method to reduce the abundance of Yellowstone bison. They continued discussions of how to increase the effectiveness of hunting, including appropriate locations to hunt bison, length of season, and quotas for both Montana (controlled by MFWP) and tribal (controlled by the tribes) hunts. MFWP and MDOL met with the CSKT, NPT, Confederated Tribes of the Umatilla, and Shoshone-Bannock Tribes to discuss harvest strategies (one key to managing demographic ratios and sub-population distribution, as described in the draft Winter Operations Plan put forth by NPS in August 2012). They also discussed logistics to provide a safe hunting program, including the possible addition of a winter/spring hunt in the newly expanded north-side tolerance area and the potential for a hunt in lands being considered for increased tolerance in the northwest corner of YELL.
- **Winter Operations Plan.**—The NPS presented a draft Winter 2012/13 Operations Plan during the August 2012 IBMP meeting. Partner edits will be made during autumn 2012, with a signing of the Operations Plan expected in November 2012 IBMP meeting. It will be the first update of the Operations Plan to incorporate the adaptive changes adopted since 2009.
- **Partner Protocols.**—The IBMP Partners recognize the need to set up more consistent business practices with respect to such items as document editing, document signing, teleconferences, adapting AM changes, decision making, and other processes needed for conducting efficient interagency meetings.

Over the course of the past year, the Partners created and edited a set of protocols (“Partner Protocols”) to help formalize their interactions. The protocols are expected to be signed at the November 2012 IBMP meeting.

- **Communication with the public.**—The IBMP information portal, www.ibmp.info, continues to serve as a data repository for IBMP-related materials such as historical reports, environmental evaluations, meeting agendas, and summary reports on IBMP meetings, with links to agency web sites that have additional data and reports about Yellowstone bison conservation and prevention of brucellosis transfer to cattle. In addition, members of a Citizens’ Working Group (CWG) directly addressed the IBMP on multiple occasions, including a full day meeting in February dedicated to Partner/CWG discussion of CWG recommendations.
- **Citizens’ Working Group.**—A CWG was formed in 2011 under citizen initiative with encouragement and facilitator funding from the IBMP agencies. The group met monthly from January-October 2011. Upon request, the IBMP agencies provided endorsement to, and some thoughts on, initial goals for the CWG, but sought not to bias or direct specific CWG deliberations. The CWG provided its recommendations to the Partners at the November 30, 2011 IBMP meeting. Partners met again in February 2012 in special session to respond to the CWG recommendations—some were lumped together, some accepted, some rejected, some put off with a request to the CWG for greater clarification. Those in the latter category were further discussed with the CWG during the May 2012 IBMP meeting, with the Partners making a final accept/reject decision. The Partners agreed to track progress toward accomplishing the recommendations they accepted as part of the annual report, beginning with this report.
- **Subcommittee deliberations.**—Four subcommittees were created in February 2011 to consider and report to the Partners on potential adaptive management adjustments regarding (1) available habitat outside YELL, (2) restoration of bison beyond the current conservation area for Yellowstone bison, (3) transfer of surplus bison to other administrative units for the conservation of plains bison, and (4) appropriate methods for reduction of brucellosis infection. The subcommittees provided final presentations in November 2011. The subcommittees then deliberated the merits of a set of the CWG recommendations, and provided accept/reject guidance to the Partners regarding the CWG recommendations.
- **On-going Partner, staff, and public education.**—IBMP meetings included numerous educational presentations in science and public policy realms, including (1) NPS response to numerous papers on genetic diversity in Yellowstone bison; and (2) a report on the status of the Montana Statewide Bison Management Plan. Additionally, based on a CWG recommendation, a committee was formed between members of the CWG and MFWP to create an educational program for the general public about bison topics.

Management Actions for the IBMP

Management Action 1.1a: Allow untested female/mixed groups of bison to migrate onto and occupy the Horse Butte peninsula and the Flats each winter and spring in Zone 2.

Monitoring Metric 1: Weekly surveys of the number and distribution of bison on Horse Butte, the Flats, crossing the Narrows, and going beyond the Madison Resort (Lead = MDOL).

Data for bison in the West Management area are shown in Figure 1 and a comparison of 2009-2012 in Figure 2.

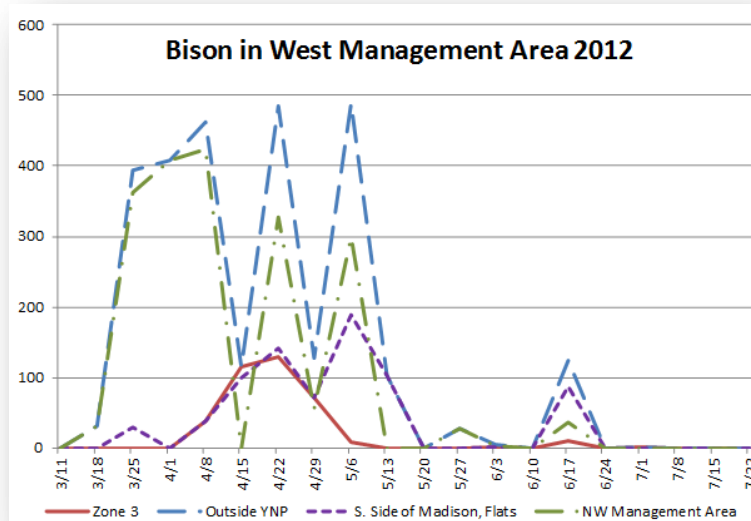


Figure 1.—Peak bison abundance by week in various portions of the Western Management Area during the 2012 management season.

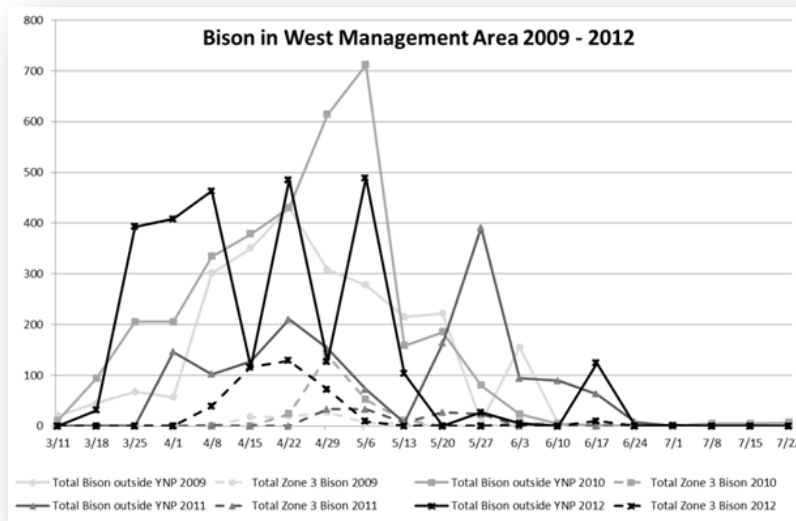


Figure 2.—Comparison of bison abundance in the Western Management Area during the 2009–2012 management seasons.

Monitoring Metric 2: Annually document the number of bison using Zone 2 and the number and type of management activities needed to manage bison distribution (Lead = MDOL).

Please see Appendix A for a complete list of bison numbers and hazing operations in the Western Management Area.

Monitoring Metric 3: Create a density curve of the threshold number of bison on Horse Butte that results in movements of bison to the South Fork Madison area (Lead = MDOL).

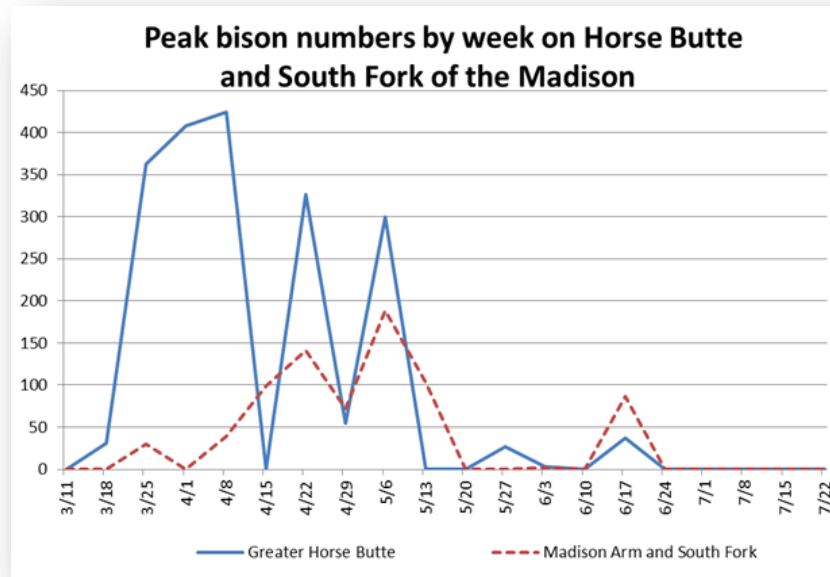


Figure 3.—Comparison of bison abundance by week on Horse Butte and the South Fork Madison area.

Monitoring Metric 4: Determine natural routes and timeframes (without hazing) for bison migration back into the park (Lead = NPS). Use this information to evaluate the effectiveness of management responses for bison tolerance in Zone 2 (Lead = MDOL).

Traditionally radio-marked bison have used two primary migration routes to reach the western boundary of Yellowstone National Park and move into the Hebgen basin of Montana. Bison move west along the Madison River to the area near 7-mile bridge, after which some bison travel north through Cougar Meadows and some bison travel west through Baker's Hole. These routes intersect further west along the Madison River, after which nearly all bison move along the north bank of the Madison River to Hebgen Lake. Initially, bison use the bench above the north bank of the Madison River and the Madison Arm of Hebgen Lake, but bison eventually access both sides of the lake when conditions are suitable. Some bison use the lake's delta as a way to cross from the Horse Butte peninsula to the south side of the Madison Arm. The bison use these same routes in reverse when they return to summer ranges inside the park.

Bison began migrating into the western risk management zone outside YELL during autumn, but few remained outside the park until March and April (Table 1). Bison were tolerated in Zone 2 in accordance with the Adaptive Management Plan for this management season. Hazing operations were initiated in mid-April and continued until all bison returned to the park at the end of the management season.

Bison did not show signs of return migration back into the park prior to the initiation of hazing. Thus, there is no data this year to describe the timing of their natural tendencies for spring migration toward summer ranges at higher elevations.

Table 1.—Numbers of bison observed during aerial counts conducted over the western management area during October 2011 to June 2012.

Location	Numbers of Bison Observed							
	Oct 20	Dec 17	Jan 27	Feb 15	Mar 22	Apr 22	May 20	Jun 21
IBMP Zone 1	33	116	112	70	96	171	10	134
IBMP Zone 2	1	16	0	0	93	354	179	6
West of Madison Junction to 7-mile bridge	2	89	431	195	130	0	121	128
Total	36	221	543	265	319	525	310	268

Note: Thirteen bison were reportedly harvested by Montana-licensed hunters and members of the Confederated Salish and Kootenai Tribes in the Western Management Area outside YELL during the early hunting period.

Management Action 1.1b: Use adaptive management to gain management experience regarding how bison use Zone 2 in the Gardiner basin, and provide space/habitat for bison in cattle-free areas.

Monitoring Metric 1: Weekly survey of the number and distribution of bison in the Eagle Creek/Bear Creek area and the Gardiner basin (Lead inside YELL = NPS; Lead outside YELL = MDOL with MFWP).

NPS staff conducted periodic aerial surveys through winter 2011-12 to estimate the number of bison occupying northern IBMP management monitoring areas, including the Eagle Creek/Bear Creek and Gardiner basin areas (Table 2).

Table 2.—Summary of the abundance of Yellowstone bison in the Northern Management Area based on aerial surveys between October 2011 and June 2012.

Location	Numbers of Bison Observed							
	Oct 20	Dec 17	Jan 27	Feb 15	Mar 22	Apr 22	May 20	Jun 21
IBMP Zone 1	0	27	0	13	37	90	8	0
IBMP Zone 2	0	0	0	0	2	0	0	0
Eagle Creek, Gallatin National Forest	0	2	0	0	5	0	0	0
Hellroaring Slope	272	522	558	230	338	149	27	0
Blacktail Deer Plateau	73	382	573	1,418	822	979	352	193
Swan Lake, Gardners Hole	11	47	32	37	4	10	10	6
Total	356	980	1,163	1,698	1,208	1,228	397	199
Numbers in Gardiner Basin	0	29	0	13	44	90	8	0
Numbers in the Stephens Creek facility	0	0	0	0	0	0	0	0

Note: Fifteen bison were reportedly harvested in the northern management area outside YELL during winter.

Figure 4 shows the number of bison outside the boundary of YELL at one time in the North Management Area.

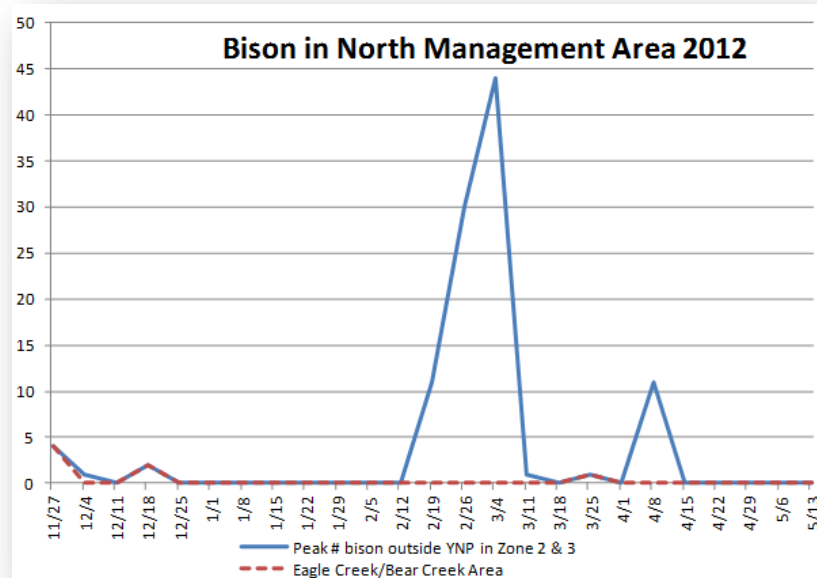


Figure 4.—Bison abundance in various portions of the Northern Management Area during the 2011-2012 management season.

Monitoring Metric 2: Annually document the numbers and dates that bison attempt to exit Zone 2 by passing through Yankee Jim Canyon, west up Mol Heron Creek Canyon, or to the east side of the Yellowstone River and north of Little Trail Creek (Lead = MDOL/MFWP).

Bison never attempted to exit Zone 2 by passing through Yankee Jim Canyon or Mol Heron Creek Canyon (Table 3). There were five instances of bison entering Zone 3 east of the Yellowstone River and north of Little Trail Creek.

Table 3.—Movement of bison trying to exit Zone 2 via multiple routes.

Date	Eagle Creek/ Bear Creek Area	Yankee Jim Canyon Zone 3	Mol Heron Creek Canyon Zone 3	East of River/ North of Little Trail Creek Zone 3	Gardiner Basin Zone 2	Total Bison Outside YNP
11/28/11	4	0	0	0	0	4
12/5/11	0	0	0	0	1	1
12/22/11	2	0	0	0	0	2
2/23/12	0	0	0	0	11	11
3/2/12	0	0	0	0	30	30
3/5/12	0	0	0	1	11	12
3/6/12	0	0	0	0	11	11
3/8/12	0	0	0	11	33	44
3/9/12	0	0	0	11	33	44
3/12/12	0	0	0	0	0	0
3/13/12	0	0	0	0	1	1
3/29/12	1	0	0	0	0	1
4/8/12	0	0	0	3	8	11
4/10/12	0	0	0	8	0	8

Monitoring Metric 3: Annually document the number of bison using Zone 2 and the number of management activities needed to manage bison distribution (Lead = MDOL/MFWP).

Bison began occupying the Zone 2 area of the Gardiner Basin in late November 2011, and sporadically used the area until early April. The maximum number of bison outside the park at one time was 44 in early March. MDOL participated in one hazing operation at the request of MFWP on April 10 to remove eight bull bison from private property.

Monitoring Metric 4: Annually collect data to update the relationships between bison management at the Stephens Creek facility and the interaction between bison density and snow pack in the central and northern herds (Lead = NPS).

NPS staff and colleagues published a scientific article (Geremia et al. 2011) summarizing analyses of the relationships between bison population size, accumulated snow pack, aboveground dried biomass, and the number of bison migrating to the boundary of YELL. A summary of these findings was included in the 2011 IBMP annual report.

Monitoring Metric 5: Annually collect data to determine natural migration routes and timeframes (in the absence of hazing) for bison migration out of and back into the park (Lead inside YELL = NPS; Lead outside YELL = MDOL/MFWP).

Migration routes out of the park included two primary routes into the Gardiner basin: (1) across the Blacktail Deer Plateau and down the Lava Creek drainage along the creek or the road corridor; and (2) down the Yellowstone River trail to Eagle Creek (out of park). Migration routes further north progressed through the Yellowstone River valley and adjacent foothills. These same routes are used in reverse when bison begin to migrate to higher elevation summer ranges in response to spring green-up conditions.

There was little movement into the Gardiner basin through the winter due to relatively low accumulation of snow on the Blacktail Deer Plateau. By mid-December 2011 less than 20% of the northern herd and few bison from the central herd had migrated to the Blacktail Deer Plateau. There were approximately 30 bison in the Gardiner basin at this time. By mid-March, bison in northern Yellowstone were distributed widely across the Lamar Valley, Little America, Blacktail Deer Plateau, and Hellroaring slopes. However, snow had largely melted on the Blacktail Deer Plateau and in Little America by late March, and there were only 40 to 90 bison in the Gardiner basin through late April. Only small groups of bull bison were seen in the Gardiner basin during May.

There was very limited migration of bison into tolerance zones north of YELL during the 2011-12 winter season. Small groups of bison (maximum group size was 33 mixed bison) were reported in the Gardiner basin north of YELL sporadically throughout the management season. MDOL had no reports of bison in the Gardiner basin after April 10.

Management Action 1.1c: Use research findings on bison birth synchrony and fetal and shed *Brucella abortus* field viability and persistence to inform adaptive management.

Monitoring Metric 1: Complete research reports and attempt to publish findings in a peer-reviewed, scientific journal (Lead = MFWP and NPS).

Staff from MFWP, APHIS, and other agencies published findings in *The Journal of Wildlife Management* regarding the persistence of *Brucella* bacteria and infectious birth materials shed on pastures where cattle graze near the northern and western boundaries of YELL (Aune et al. 2012). They performed three independent field experiments to determine: (1) persistence of *Brucella abortus* (RB51) purposely applied to fetal tissues, (2) scavenging of fetuses by native scavengers, and (3) natural contamination of birth or abortion sites in the GYA. Results from these field experiments established that *Brucella* bacteria can persist on fetal tissues and soil or vegetation for 21–81 days depending on month, temperature, and exposure to sunlight. Bacteria purposely applied to fetal tissues persisted longer in February than May and did not survive on tissues beyond June 10 regardless of when they were set out. *Brucella abortus* field strain persisted up to 43 days on soil and vegetation at naturally contaminated bison birth or abortion sites. Fetuses were scavenged by a variety of birds and mammals in areas near YELL and more rapidly inside YELL than outside the park boundary. Models derived from the data determined a 0.05% chance of bacterial survival beyond 26 days (95% credible interval of 18–30 days) for a contamination event in May. May 15 is the final date for hazing all

bison into YELL under the current interagency bison management plan. With these data, managers can predict when it is safe to graze cattle onto pastures previously occupied by bison.

Results of a study by NPS staff during 2004-2007 to estimate the timing and location of bison parturition events that may shed tissues infected by *Brucella abortus* were published in the scientific *Journal Wildlife Biology* (Jones et al. 2010) and summarized in the 2011 IBMP annual report.

Results of a study by NPS staff and colleagues that integrated age-specific serology and *Brucella abortus* culture results from slaughtered Yellowstone bison to estimate probabilities of active brucellosis infection were published in the *Journal of Applied Ecology* (Treanor et al. 2011). Infection probabilities were associated with age in young bison (0-5 years old) and with elevated antibody levels in older bison (>5 years old). Results indicated that Yellowstone bison acquire *Brucella abortus* infection early in life but typically recover as they grow older. A tool was developed to allow bison management to better reflect the probability that particular animals are infective, with the aim of conserving Yellowstone bison while reducing the risk of brucellosis transmission to cattle. Combining selective removal of infectious bison with additional management practices, such as vaccination, has the potential to advance an effective brucellosis reduction program.

Management Action 1.2a: Allow bachelor groups of bull bison to occupy suitable habitat areas outside the west boundary of YELL in the portion of Zone 2 south of Duck Creek each year within the parameters of conflict management.

Monitoring Metric 1: Weekly counts and locations of bull bison in Zone 2 (Lead = MDOL).

Bulls were tolerated within the management area in accordance with the Adaptive Management Plan. Operations were initiated on the occasions described in Table 4.

Table 4.—Weekly counts and location of bull bison in Zone 2.

Date	# Bulls	Location of Bison
6/4	2	West of the South Fork
6/5	3	North Duck Creek Management Area
6/18	7	West of the South Fork
7/3	1	Hwy 287 west of MA

Monitoring Metric 2: Document threats to human safety and property damage (Lead = MFWP).

MFWP reported 447 responses to IBMP-related matters between November 2011 and August 2012. Details of those incidents and responses are provided chronologically in Appendix B, Table B1. These activities generally concern public safety and not necessarily threats.

Management Action 1.2b: Allow bachelor groups of bull bison to occupy suitable habitat areas in Zone 2 outside the north boundary of YELL within the following parameters of conflict management.

Monitoring Metric 1: Weekly counts and locations of bull bison in Zone 2 (Lead = MDOL/MFWP).

Table 5.—Weekly counts and locations of bull bison in Zone 2.

Week of	# Bulls	Location	Operations
11/27/11	4	Eagle Creek Area	No
12/4/11	1	Cutler Lake	No
12/18/11	2	Eagle Creek Area	No
3/4/12	1	Corwin Springs	No
3/11/12	1	Beattie Gulch	No
3/25/12	1	Eagle Creek Area	No
4/8/12	3	Yankee Jim Canyon cattle guard	No

Table 5.—Weekly counts and locations of bull bison in Zone 2.

Week of	# Bulls	Location	Operations
	8	Beattie Gulch	No
	8	Private property east of the river	Yes

Monitoring Metric 2: Document threats to human safety and property damage (Lead = MFWP/MDOL).

MFWP reported 447 responses to IBMP-related matters between November 2011 and August 2012. Details of those incidents and responses are provided chronologically in Appendix B, Table B1. These activities generally concern public safety and not necessarily threats.

Monitoring Metric 3: Annually document the numbers and dates that bull bison attempt to exit Zone 2 by passing through Yankee Jim Canyon, west up Mol Heron Creek Canyon, or to the east side of the Yellowstone River and north of Little Trail Creek (Lead = MDOL/MFWP).

Bulls exited Zone 2 east of the river and north of Little Trail Creek three times during the 2011-2012 management season, on March 5, April 8, and April 10. There were no reports of bulls leaving Zone 2 through Yankee Jim Canyon or Mol Heron Creek Canyon.

Management Action 1.3a: Work with private land owners and livestock producers and operators to provide conflict-free habitat in the Hebgen and Gardiner basins.

Monitoring Metric 1: Create an annual record of the: (a) number of acres made available to bison from conservation easements (Lead = MFWP); (b) locations, numbers, types, and turn-out/off dates for cattle grazed on private land in the Hebgen and Gardiner basins (Lead = MDOL); and (c) extent of fencing erected to separate bison from livestock (Lead = MDOL).

Conservation Easements

No acres were made available to bison from conservation easements during the 2011/2012 season.

North Management Area Cattle Use

Table 6.—Locations, numbers, types, and turn-out/off dates for cattle grazed on private land in the north management area.

Owner	Zone	No. Cattle	Maximum	Class	On-date	Off-date
BH	3/GB	20/1		pairs/bull	year-round	n/a
JT	3/GB	23		pairs	year-round	n/a
VS	3	100	250	pairs	May 21	December 31
Grizzly Creek	3	100	250	pairs	May 21	December 31
Yellowstone Cattle Co	3	100	600	pairs	May 21	December 1
B-Bar	3	150	600	pairs	June 15	November 15
Anderson Ranch	3	100	160	pairs	June 15	November 15
West Creek Ranch	3	100	100	pairs	June 1	November 1

West Management Area Cattle Use

Table 7.—Locations, numbers, types, and turn-out/off dates for cattle grazed on private land in the west management area.

Property Owner	Livestock Owner	Zone	Date in	No. Cows	No. Calves	No. Bulls	No. Yearling Heifers	No. Yearling Steers
SR Red Creek Ranch	BM Reed Point, MT	2	June 20	200	200	4		
RS Duck Creek	BM Reed Point, MT	2	June 20	31	31	1		
PP Deep Well Ranch	LM Twin Bridges, MT	3	June 15	320	320	10		
LD Quarter Circle JK	CC/BF Cameron, MT	3	July 1*	22	21	1	1	1
USFS South Fork Allotment	CC/BF Cameron, MT	3	July 1*	11	11	1	5	
USFS Watkins Creek Allotment	CC/BF Cameron, MT	3	July 1*	55	55	4		
RP Diamond P Ranch	BM Billings, MT	3	June 15		6	1	9	2

* Dates and cattle numbers are from 2011.

Fencing

No fencing was erected to separate bison from livestock.

Management Action 1.3b: Work with landowners who have human safety and property damage concerns, as well as those who favor increased tolerance for bison, to provide conflict-free habitat in the Hebgen and Gardiner basins.

Monitoring Metric 1: Annually document the numbers, timing, and types of reported incidents for human safety and property damage related to bison (Lead = MFWP with support from MDOL).

MDOL referred all calls to MFWP.

MFWP reported 447 responses to IBMP-related matters between November 2011 and August 2012. Details of those incidents and responses are provided chronologically in Appendix B, Table B1. These activities generally concern public safety and not necessarily threats.

Monitoring Metric 2: Annually document the numbers and types of actions taken to provide conflict-free habitat for bison (Lead = MFWP with support from MDOL).

MDOL referred all calls to MFWP.

MFWP reported 447 responses to IBMP-related matters between November 2011 and August 2012. Details of those incidents and responses are provided chronologically in Appendix B, Table B1. These activities generally concern public safety and not necessarily threats.

Management Action 1.3c: Annually, the Gallatin National Forest will ensure conflict-free habitat is available for bison and livestock grazing on public lands, as per management objectives of the IBMP.

Monitoring Metric 1: Annually track the status (e.g. number of acres, location, etc.) of active and inactive cattle grazing allotments on public lands (Lead = USFS).

Forest Service grazing allotments within and near the adaptive management areas are summarized in Appendix C and changes to their management are briefly summarized below¹. However, it is important to note that allotment status (i.e., Active, Vacant, or Closed in Appendix C) does not correspond with compatibility for bison presence on those allotments. The Gallatin National Forest can consider various options with grazing permit holders to alleviate potential bison/livestock conflicts. This may include adaptive management National Environmental Policy Act (NEPA) decisions such as authorizing a change in the kind of livestock, non-use for resource protection, or other identified opportunities.

North Side

In 2012, the grazing permittee on the Slip and Slide allotment took “non-use” for 47 cow/calf pairs on one permit remaining in this allotment.

West Side

The South Fork and Watkins Allotments were analyzed in an Environmental Assessment and a decision is forthcoming in November 2012. One alternative under consideration directly addresses the opportunity to modify the type of livestock on the allotment, should the management zone boundaries change for bison, to alleviate concerns for brucellosis transmission.

The Sulphur Springs allotment went from active to vacant (10 horses; 7/1- 9/30). Grazing permittees on both the Basin (10 cow/calf pairs from 7/21-9/19) and Sheep-Mile allotments (89 yearlings from 6/20-10/20) took “non-use” in 2012.

Management Action 2.1a: Increase the understanding of bison population dynamics to inform adaptive management and reduce sharp increases and decreases in bison abundance.

Monitoring Metric 1: Conduct aerial and ground surveys to estimate the annual abundance of bison each summer (Lead = NPS).

NPS staff completed three aerial surveys of the bison population during June and July 2011 and estimated a minimum population size of 3,700 bison with a 95% confidence interval around this estimate as 2,841 to 4,613 bison (Figure 5).

¹ USFS personnel noted that the 2011 report lists Horse Butte as vacant; however that allotment was officially closed in November 2009.

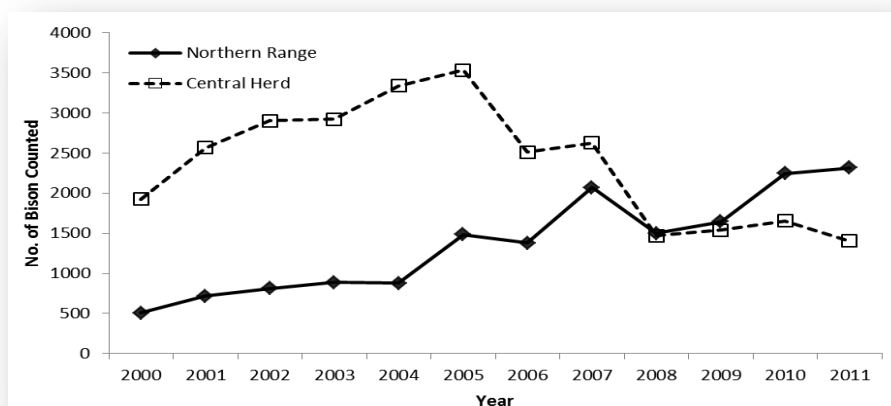


Figure 5.—Numbers of Yellowstone bison observed in the central and northern breeding herds during aerial surveys in summer from 2000 to 2011.

Monitoring Metric 2: Document and evaluate relationships between bison migration to the boundary of YELL and bison abundance, population (or subpopulation) growth rates, and snow pack in the central and northern herds (Lead = NPS).

See Management Action 1.1b, Monitoring Metric 4.

Monitoring Metric 3: Continue to obtain estimates of population abundance through the remainder of the year based on surveys, knowledge of management removals, and survival probabilities (Lead = NPS).

Periodic monitoring for distribution resulted in the counts shown in Table 8 throughout the remainder of the year. During late winter, aerial surveys are less accurate due to ground fog and the scattered distribution of bison, especially those bison that find refuge in forested habitat.

Table 8.—Counts of Yellowstone bison observed during aerial distribution surveys in Yellowstone National Park and adjacent areas of Montana from October 2011 to April 2012.

Month	Northern YELL	Central YELL
October 2011	2,153	1,299
December 2011	2,288	1,248
January 2012	2,272	1,200
February 2012	2,236	1,073
March 2012	1,945	829
April 2012	2,271	731

Monitoring Metric 4: Conduct an assessment of population range for bison in YELL that successfully addresses the goals of the IBMP by retaining genetic diversity and the ecological function and role of bison, while lessening the likelihood of large-scale migrations to the park boundary and remaining below the estimated carrying capacity of the park's forage base (Lead = NPS).

NPS staff and colleagues published a scientific article (Plumb et al. 2009) in the journal *Biological Conservation* summarizing analyses of the population range that should satisfy the collective long-term interests of stakeholders as a balance between the park's forage base, conservation of the genetic integrity of the bison population, protection of their migratory tendencies, brucellosis risk management, and other societal constraints related to management of bison. A summary of these findings was included in the 2011 IBMP annual report.

Management Action 2.1b: Increase the understanding of genetics of bison in YELL to inform adaptive management.

Monitoring Metric 1: Complete an assessment of the existing genetic diversity in bison and how the genetic integrity of bison may be affected by management removals (all sources combined) by October 2010 to estimate existing genetic diversity and substructure in the population (Lead = NPS).

NPS staff collaborated with colleagues at University of Montana to conduct DNA extractions with fecal samples collected from Yellowstone bison in the northern and central breeding herds during 2006 and 2008. Mitochondrial DNA analyses revealed two haplotypes, with higher frequency of haplotype 8 in the northern breeding herd, and significant genetic differentiation among northern and central herds ($F_{ST} = 0.40^2$). Conversely, microsatellite analyses revealed allele frequencies with low levels of subdivision between the central and northern breeding herds ($F_{ST} = 0.02$ in 2006 and 0.01 in 2008). Thus, these results suggest the population has two genetically distinguishable breeding groups with strong female philopatry and male-mediated gene flow. Radio-marked adult females provided evidence of female fidelity, but emigration between breeding groups was substantial during 2007-2012. Staff recommended long-term monitoring of microsatellite allele and mitochondrial haplotype frequencies to track genetic diversity and population substructure. F_{ST} values are expected to fluctuate as the population responds to the bison density in the two breeding herds, management actions (e.g., culling), and natural selection.

In a study partially funded and supported by the NPS, Halbert et al. (2012) investigated the potential for limited gene flow across the Yellowstone bison population using blood and hair samples primarily collected from bison at the northern and western boundaries of the park during the winter migration period, well after the breeding season. Two genetically distinct and clearly defined subpopulations were identified based on both genotypic diversity and allelic distributions. Genetic cluster assignments were highly correlated with sampling locations for a subgroup of live-captured individuals. Furthermore, a comparison of the cluster assignments to the two principal winter cull sites revealed critical differences in migration patterns across years. The two Yellowstone subpopulations displayed levels of differentiation that are only slightly less than that between populations which have been geographically and reproductively isolated for over 40 years. The authors suggested that the continued practice of culling bison without regard to possible subpopulation structure has the potentially negative long-term consequences of reducing genetic diversity and permanently changing the genetic constitution within subpopulations and across the Yellowstone population.

NPS staff (White and Wallen 2012) disputed some of the assumptions and inferences made by Halbert et al. (2012) and suggested that human manipulation had created and maintained much of the observed population subdivision and genetic differentiation in Yellowstone bison. Extensive monitoring of the movements and productivity of radio-collared bison since 2005, when the population reached an abundance of approximately 5,000 bison, suggests that emigration and gene flow is now much higher than suggested by Halbert et al. (2012). Thus, White and Wallen (2012) suggested that allowing the bison to migrate and disperse between breeding herds would be in the best interest of the bison population for the long term. They agreed that bison removals should be carefully managed to prevent unintended consequences and provided references that indicate such management is occurring with frequent assessments of progress toward desired conditions. However, White and Wallen (2012) questioned whether the NPS should actively manage to preserve the genetic distinctiveness of each breeding herd because history indicates humans likely facilitated the creation and maintenance of this population substructure. Instead, they recommended that the NPS continue to allow ecological processes such as natural selection, migration, and dispersal to prevail and influence how population and genetic substructure is maintained in the future rather than actively managing to perpetuate an artificially created substructure. The existing population and genetic substructure may be sustained over time through natural selection or it may not.

Monitoring Metric 2: Conduct an assessment of the genetic diversity necessary to maintain a robust, wild, free-ranging population that is able to adapt to future conditions (Lead = NPS).

NPS staff and colleagues published a scientific article (Pérez-Figueroa et al. 2012) that evaluated the effects of variance in male reproductive success and annual variations in population size due to culling on the maintenance of genetic diversity in Yellowstone bison. A summary of these findings was included in the 2011 IBMP annual report.

² F_{ST} is the portion of total genetic variance contained in a subpopulation compared to the total genetic variance. Values can range from 0 to 1 and high F_{ST} implies considerable differentiation among subpopulations.

Management Action 2.1c: Increase understanding of the ecological role of bison to inform adaptive management by commissioning a comprehensive review and assessment.

Monitoring Metric: Develop and implement by October 2011 a joint research strategy agreed to by the interagency partners that focuses on understanding the role and function of bison for providing nutrient redistribution, prey and carrion, and microhabitats for other species (Lead = NPS).

The NPS continued a collaborative, 3-year research project with Syracuse University to quantify forage production and consumption at six study sites across the northern grasslands in YELL. Five or six grazing exclosures were deployed at each site. Production and percent consumption estimates were made monthly from May to September. The data collected this summer will be analyzed and described in a progress report during the upcoming winter.

During the 1980s and 1990s, migratory ungulates on the northern grassland of YELL had tight biogeochemical linkages with plants and soil microbes that doubled the rate of net nitrogen mineralization, stimulated aboveground production by as much as 43%, and stimulated belowground productivity by 35% (Frank and McNaughton 1993). These biogeochemical linkages were largely driven by high densities of elk that deposited large quantities of nitrogen, phosphorus, and other nutrients via dung and urine. However, rates of ungulate grazing intensity and grassland nitrogen mineralization were reduced by 25-53% by 1999-2001, partially as a result of 60% fewer elk.

Since 2002, bison numbers in northern Yellowstone have more than tripled and larger groups of grazing bison could potentially have quite different effects than elk on nutrient redistribution and cycling on grasslands. This project should help elucidate the influence of recent changes in elk and bison numbers and distributions on ecosystem processes such as the spatial pattern and intensity of ungulate grazing and grassland energy and nutrient dynamics. The project will replicate previous work describing plant production on grazed and ungrazed sites sampled 10 and 20 years ago (Frank and McNaughton 1993, Frank 2008) to compare the effects of grazing across multiple decades and evaluate the effects of changes in grazer densities (e.g., bison, elk) on nutrient cycling and plant productivity.

Management Action 2.2a: Use slaughter only when necessary; attempt to use other risk management tools first.

Monitoring Metric 1: Annually document the number, age, sex, and sero-status of bison sent to slaughter (Lead = APHIS with the MDOL).

No animals were sent to slaughter this management season.

Management Action 2.2b: In Zone 2 lands adjacent to YELL, emphasize management of bison as wildlife and increase the use of state and treaty hunts to manage bison numbers and demographic rates, limit the risk of brucellosis transmission to cattle, and protect human safety and property.

Monitoring Metric 1: Weekly and annual summaries of bison harvested by state and treaty hunters (Lead = MFWP / NPT / CSKT).

State of Montana hunt summary

Monitoring was accomplished via modified harvest survey at the completion of each hunt period and non-mandated hunter reporting (Table 9).

Table 9.—Record of Montana Bison Hunt from Nov 15, 2011 to Feb 15, 2012.

<i>Hunting District</i>	<i>Bulls Taken</i>	<i>Cows Taken</i>	<i>Total Bison Taken in District</i>
Montana Bison Hunt Period 1 (November 15 - December 31, 2011)			
385-00 GARDINER	2	0	2
395-00 WEST YELLOWSTONE	2	2	4
Total	4	2	6

Table 9.—Record of Montana Bison Hunt from Nov 15, 2011 to Feb 15, 2012.

Hunting District	Bulls Taken	Cows Taken	Total Bison Taken in District
SuperTag Winner	sex unknown		1
Montana Bison Hunt Period 2 (January 1 - January 22, 2012)			
385-01 GARDINER	0	0	0
395-01 WEST YELLOWSTONE	0	3	3
Total	0	3	3
Montana Bison Hunt Period 3 (January 23 - February 15, 2012)			
385-01 GARDINER	0	0	0
395-01 WEST YELLOWSTONE	0	1	1
Total	0	1	1
State licensed bison harvest	4	6	11*

* The sex of one animal harvested is unknown due to a lack of reporting by the hunter.

- ☐ The first Montana bison hunt period began November 15, 2011 and ended December 31, 2011. The harvest rate was 50 percent (12 licensed state hunters and 6 reported bison taken). These numbers do not take into account any bison harvested by tribes having aboriginal hunting rights.
- ☐ The second Montana bison hunt period began January 1, 2012 and ended January 22, 2012. The harvest rate dropped from 50 percent in the first period to under 20 percent in the second period as just three of 16 hunters had success in the field. The three bison taken were cows and were harvested in the West Yellowstone hunting district (395-01). Presumably, the milder weather and lack of snow played a large part in the limited migration from YELL.
- ☐ The third and final hunt period began on January 23, 2012 and ended February 15. The third hunt period only yielded one successful hunt with one individual taking a bull on the west side. Therefore, the harvest for the season totaled 11 animals (4 cows, 6 bulls, and one bison of an unknown sex).
- ☐ Aboriginal hunting season harvests are compiled by respective tribes. CSKT and NPT results are reported below. The Shoshone-Bannock and the Confederated tribes of the Umatilla both reported zero harvest.

2011-12 Confederated Salish and Kootenai Tribes bison harvest summary

CSKT harvested 7 animals during their September through January regulated hunt season. During the required annual regulation orientation for all CSKT hunters, the NPS population harvest goals were provided to every hunter and the Tribal Council reserved the opportunity to terminate or modify the hunt season for population management or health and safety needs at any time during the season.

CSKT, NPT, Shoshone-Bannock, Umatilla, and MFWP conducted a pre-season hunt coordination meeting, and CSKT staff conferenced on hunt activities and population monitoring with MFWP staff on a weekly basis during the entire CSKT hunt season.

2011-12 Nez Perce Tribe bison harvest summary

The results of the 2011–2012 Nez Perce Tribe bison hunts , as reported by Chief Villavicencio 4/23/12, are shown in Table 10, with summary comments below:

- ☐ The Bison hunt started 12/29/11 and ended 3/13/12.
- ☐ Forty permits resulted in a harvest of 11 bison.
- ☐ There were two violations of Tribal Code cited during the bison season for 2011-2012, or a 98% compliance rate.
- ☐ All elk were taken at Gardiner after bison were unavailable, February 23-26, 2012.
- ☐ The bison were harvested March 1-4, and March 8-11, 2012, near Gardiner.

Table 10.—Results from 2011-2012 Nez Perce Tribe bison and elk hunts.

Date	Permits Issued	Total Bison Harvest	Bulls	Cows	Calves	Elk Harvest	Bulls	Cows	Calves
12/29/2011	0	0	0	0	0	0	0	0	0
1/1/2011	11	0	0	0	0	0	0	0	0
2/1/2012	21	0	0	0	0	9	4	4	1
3/1/2012	8	11	3	4	4	0	0	0	0
Total	40	11	3	4	4	9	4	4	1

Management Action 2.2c: Complete the quarantine feasibility study and consider an operational quarantine facility to provide a source of live, disease-free bison for tribal governments and other requesting organizations.

Monitoring Metric 1: Annual summary of bison sent to quarantine and bison transported from quarantine to suitable restoration sites (Lead = MFWP/APHIS).

No bison were sent to or taken into the quarantine facilities in 2011-2012.

Sixty-three bison (2005 and 2006 cohorts plus offspring) were transported from the quarantine facilities to the Fort Peck Reservation. Half of those are intended to go to the Fort Belknap Reservation pending completion of fencing and lifting of a court injunction against moving the quarantine feasibility study bison.

Monitoring Metric 2: Annual summaries from bison populations restored using quarantined bison from YELL, including numbers, demographic rates, and implemented risk management actions (Lead = MFWP/APHIS).

No bison populations have been restored using quarantined Yellowstone bison. Bison were moved to the Fort Peck Reservation, and some of those are to be moved to the Fort Belknap reservation where they will be managed as captive herds on the reservation.

Quarantine Feasibility Study bison are being held at the Green Ranch owned by Ted Turner for a 5-year period. Currently there are 190 bison at the Green Ranch, 83 that were originally translocated, plus offspring that have been born since.

Monitoring Metric 3: Evaluate regulatory requirements and constraints for moving live bison, including adults, to suitable restoration sites (Lead = APHIS/MDOL).

The regulatory restraints have been reviewed and incorporated into a draft protocol that outlines roles and responsibilities that will apply when live Yellowstone bison are transferred from the NPS to American Indian tribes. This protocol should be completed during 2013.

Regulatory requirements and restraints for moving bison that graduate from the Quarantine Feasibility Study primarily are associated with Montana Environmental Policy Act (MEPA) compliance and requirements of Senate Bill 212 that passed during the 2011 Legislative session. Senate Bill 212 requires MFWP to “develop and adopt a management plan before any wild buffalo or bison under the department's jurisdiction may be released or transplanted onto private or public land in Montana. A plan must include but is not limited to:

- a) measures to comply with any applicable animal health protocol required under Title 81, under subsection (2)(b), or by the state veterinarian;
- b) any animal identification and tracking protocol required by the department of livestock to identify the origin and track the movement of wild buffalo or bison for the purposes of subsections (2)(b) and (5)(c);
- c) animal containment measures that ensure that any animal transplanted or released on private or public land will be contained in designated areas. Containment measures must include but are not limited to:
 - i. any fencing required;
 - ii. contingency plans to expeditiously relocate wild buffalo or bison that enter private or public property where the presence of the animals is not authorized by the private or public owner;

- iii. contingency plans to expeditiously fund and construct more effective containment measures in the event of an escape; and
- iv. contingency plans to eliminate or decrease the size of designated areas, including the expeditious relocation of wild buffalo or bison if the department is unable to effectively manage or contain the wild buffalo or bison.
- d) a reasonable means of protecting public safety and emergency measures to be implemented if public safety may be threatened;
- e) a reasonable maximum carrying capacity for any proposed designated area using sound management principles, including but not limited to forage-based carrying capacity, and methods for not exceeding that carrying capacity; and
- f) identification of long-term, stable funding sources that would be dedicated to implementing the provisions of the management plan for each designated area.”

Movement of Quarantine Feasibility Study bison to date has generated significant public comment, as well as litigation challenging the movement of those bison.

Monitoring Metric 4: Conduct an assessment of the quarantine feasibility study and offer recommendations regarding whether the quarantine of bison should become operational (Lead = MFWP/APHIS).

An interagency advisory team recommended that bison that graduate from the Quarantine Feasibility facilities still be held and monitored for five years to ensure confidence that there is no latent infection. That additional monitoring is ongoing and will be for at least three additional years before determining if quarantine of bison should become operational.

The final assessment of the Bison Quarantine Feasibility Study is being compiled and should be available in early 2013.

Monitoring Metric 5: Identify suitable release sites for brucellosis-free bison in quarantine, and solicit proposals from groups interested in restoring bison, through the Interagency/Tribal Bison Restoration Panel (Lead = MFWP/APHIS).

Solicitation of proposals to identify suitable release sites for brucellosis-free bison (i.e., Quarantine Feasibility Study animals) have resulted in limited success and great controversy. The Ft. Belnap/Ft. Peck tribes have been identified as suitable restoration entities. A transfer of quarantine bison to Ft Peck was completed in March 2012.

Management Action 3.1a: Continue bison vaccination under prevailing authority.

Monitoring Metric 1: Document the number of eligible bison captured and vaccinated outside of the park (Lead = MDOL/APHIS).

No bison were captured and vaccinated outside the Park.

Monitoring Metric 2: Implement the Bison and Brucellosis Monitoring and Surveillance Plan (Lead = NPS).

The NPS implemented the bison monitoring and surveillance plan during 2011-2012 and an annual summary of accomplishments and monitoring results will be completed and posted on the Greater Yellowstone Science Learning Center (<http://greateryellowstonescience.org/topics/biological/mammals/bison>). No bison were captured at the Stephens Creek facility during this reporting period, thus no new vaccinates were included in the population.

An NPS biologist published a dissertation (Treanor 2012) that reported findings on the maintenance of brucellosis in Yellowstone bison, including links to seasonal food resources, host-pathogen interactions, and life-history trade-offs. Active brucellosis infection was associated with below-average nutritional condition, with the intensity of *Brucella abortus* infection being influenced by seasonal reductions in dietary protein and energy. The reproductive strategy of Yellowstone bison is linked with the seasonal availability of food, which increases bison fitness but may have consequences for *Brucella abortus* infection. Seasonal food restriction may also influence the ability of vaccinated bison to recall protective immune responses when later exposed to *Brucella abortus*. The rate of fat metabolism was an important factor influencing the cell-mediated immune response (interferon- γ production). Thus, individual variation and the seasonal availability of food may reduce vaccine efficacy when vaccination is applied at the population level (Treanor 2012).

Comparison of the immune responses following vaccination with *Brucella abortus* strain RB51 in captive and free-ranging bison indicated a single vaccination may offer some protection in approximately 50% of vaccinated yearling

female bison (Treanor 2012). Overall, immune responses following vaccination were similar between both study groups, including the proportion of individuals within each study group that showed either strong, weak, or essentially no response following vaccination. This individual variation is expected to reduce vaccine efficacy when vaccination is applied at the population level. Factors, such as seasonal food restriction and loss of body reserves, may play an important role in the effectiveness of wildlife vaccination programs. Research is needed to link within host processes (e.g., nutrition) with the induction of protective immune responses against *Brucella abortus*. Protective immune responses induced through vaccination may be limited if vaccines are delivered to undernourished animals (Treanor 2012).

Management Action 3.1b: Complete EIS processes (MEPA/NEPA) for remote delivery vaccination of bison and use the outcomes to inform adaptive management.

Monitoring Metric 1: Complete the NEPA process and reach a decision on whether remote delivery vaccination of bison can/will be employed inside YELL (Lead = NPS).

NPS staff continued evaluations regarding whether to remotely vaccinate free-ranging bison inside YELL for brucellosis using a rifle-delivered bullet with a vaccine payload. Several factors suggested that the implementation of remote delivery vaccination at this time may not achieve desired results (>50% reduction in prevalence) and could have unintended adverse effects to bison, other wildlife, and visitor experience. This deduction was based on the inconsistent syringe delivery of vaccine to eligible bison occupying the boundary ranges, probable low efficacy of remote vaccination given highly variable immune responses in wild bison and consistency issues with vaccine encapsulation and delivery, limitations of the proposed delivery technology (distance; injuries), and potentially negative behavioral responses by bison to repeated, annual remote deliveries resulting in the avoidance of humans.

To develop a lasting solution, the NPS is seeking input from independent scientists regarding the feasibility and sustainability of brucellosis suppression without significantly affecting bison behavior or visitor experience. A brucellosis science workshop, co-chaired by a representative from MFWP, is being organized for early 2013 to integrate science into a brucellosis management program that considers all stakeholder perspectives. Invited expert panelists will be asked to provide input on how brucellosis prevalence in Yellowstone bison could be reduced, as well as to identify critical knowledge gaps and research priorities that could improve brucellosis management practices. A report will be produced during 2013. Release of the final EIS evaluating whether to remotely vaccinate free-ranging bison inside YELL has been postponed until this input is received and evaluated.

Monitoring Metric 2: Based on the MEPA process, determine if remote delivery vaccination of bison can/will be employed outside of YELL (Lead = MDOL).

Currently awaiting NPS decision.

Management Action 3.1c: Test and vaccinate cattle.

Monitoring Metric 1: By June 15th, determine and document the vaccination status of all “at-risk” cattle in or coming into the Hebgen and Gardiner basins. (Lead = MDOL/APHIS).

- ☐ Vaccination is required in the entirety of the four counties in which Montana’s designated surveillance area (DSA) is located (Beaverhead, Madison, Gallatin, and Park). All eligible cattle that reside or seasonally graze in the Hebgen and Gardiner basins are required to be vaccinated.
- ☐ All female cattle resident in the Gardiner Basin have received both a calfhood vaccination and an adult booster of the RB-51 *Brucella abortus* vaccine.
- ☐ All female cattle coming into the Hebgen Basin have received a calfhood vaccination of the RB-51 *Brucella abortus* vaccine.

Management Action 3.2a: Use spatial and temporal separation and hazing to prevent cattle/bison interactions.

Monitoring Metric 1: Document the minimum temporal separation and space between bison and cattle during February through June (Lead = MDOL).

In the Northern Management Area, there were two reports of bison comingling with livestock, once in March and once in April. Sex of the bison involved in the March comingling event is unknown—it was called in by the property owner, but he hazed them himself, so MDOL never actually went out. The April event was a group of 8 bulls.

In the Western Management Area, mixed bison were present on private property in the South Fork area of Zone 3 as late as June 20, five days after cattle turnout in the area. Mixed bison were present in the Red Canyon/Duck Creek area as late as June 1, 19 days prior to cattle turnout in the area. A single bull was present in Zone 3 on the north side of the Western Management Area on July 3, 13 days after cattle turnout in the Zone 2/Duck Creek area.

Monitoring Metric 2: Document the number of times bison are successfully or unsuccessfully moved to create separation in time and space from cattle (Lead = MDOL).

In the Northern Management Area, only one hazing operation occurred to remove bison from livestock on private property.

In the Western Management Area, 29 hazing operations occurred between April 11 and July 3 to create separation from cattle. Four of those operations occurred after cattle were present in the area (June 15).

Management Action 3.2b: Evaluate the use of limited, strategically placed fencing when and where it could effectively create separation between domestic livestock and bison, and not create a major movement barrier to other wildlife.

Monitoring Metric 1: Document the number of additional acres of habitat made available for bison as a result of strategic fencing (Lead = MFWP/USFS/MDOL).

No new fences were authorized on USFS lands as described in this monitoring metric.

Monitoring Metric 2: Document fence damage or the number of times fencing fails to inhibit bison trespass on private property occupied by cattle (Lead = MDOL).

There were two reports of bison comingling with livestock in the Northern Management Area, once on March 12 and again on April 10. There was no agency hazing operation on March 12, the property owner managed to move the bison. On April 10, MDOL assisted MFWP with a hazing operation to remove the bison from private property.

Any private property complaints in the Western Management Area were referred to MFWP.

Management Action 3.2c: Haze bison from the Hebgen Basin into YELL with a target date of May 15.

Monitoring Metric 1: Consistent with management action 1.1a, assess the prevailing environmental conditions and reach consensus by May 13 on a step-wise, integrated plan for the end-of-winter return of bison into YELL from Zone 2 (Lead = MDOL/NPS).

The IBMP agencies began discussing potential haze-back dates on May 1, 2012. The approximately average snow pack that accumulated over the winter was countered by warmer than average temperatures, especially during late winter and early spring, resulting in below average water content (i.e., snow water equivalent) in the snow pack (Figures 5 and 6). Thus, the agencies agreed to begin the operations to haze bison back into the park on May 9. The West Yellowstone SNOTEL site recorded no snow starting on April 23, and only one storm provided enough snow to measure after that date through May (Figure 5, Appendix D/Table D1).

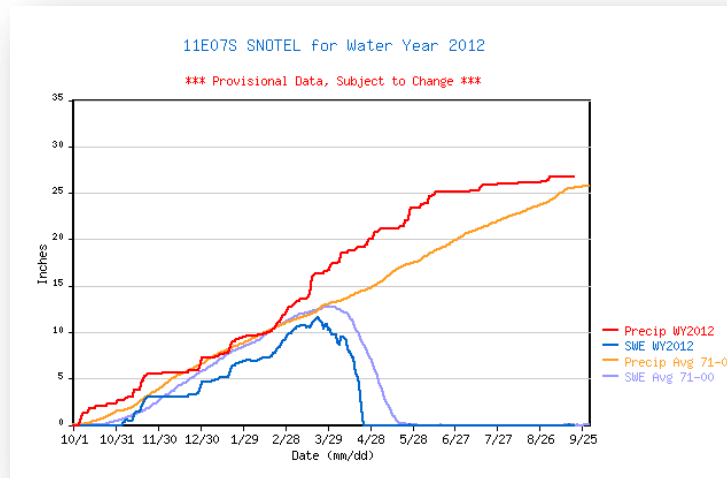


Figure 5.—Precipitation in inches and accumulated water in snow water equivalents (SWE) during winter 2012 compared to an average winter. Data are from the Natural Resources Conservation Services SNOTEL site at West Yellowstone, Montana.

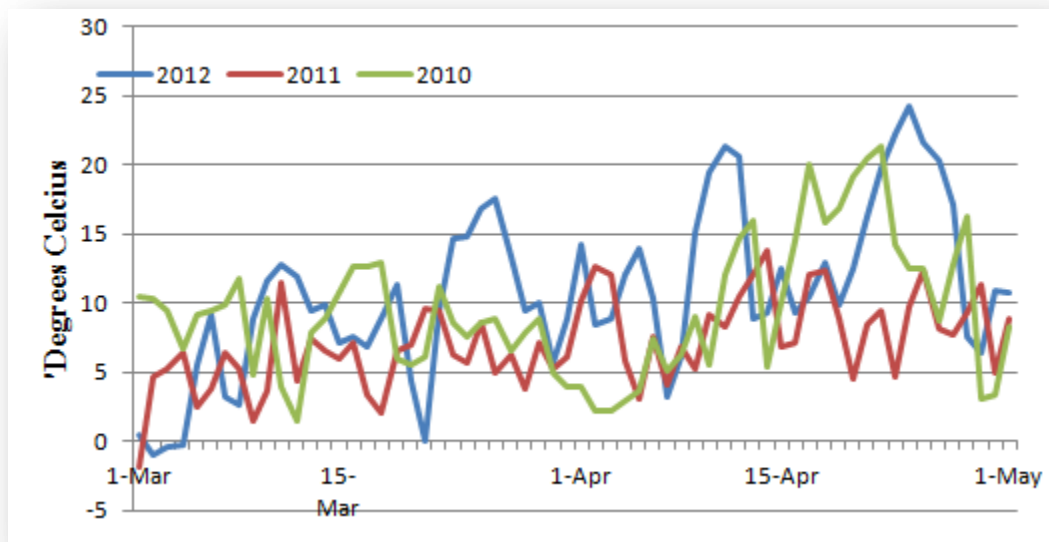


Figure 6.—Comparison of daily maximum air temperature during March and April 2010 through 2012 at West Yellowstone, Montana.

Monitoring Metric 2: Annually document the timing of the end-of-winter return of bison into YELL, the number of bison returned, prevailing environmental conditions, and success or lack thereof of hazing bison and getting them to remain in the park (Lead = MDOL/NPS).

Please see Appendix A for numbers of bison outside YELL with related hazing operations in the Western Management Area during the 2011-2012 management season. Operations began on April 11, with 33 separate operations occurring over the following 83 days.

The end-of-winter return of bison to YELL was facilitated by hazing operations conducted in May and June. The total number of bison that accumulated in the Western Management Area was about 525 (354 outside the park and 171 inside the park), as noted on a late April aerial survey (Table 11). Twelve hazing operations were conducted between April 9 and May 8 to manage the local distribution of bison in the Hebgen Basin prior to the end-of-winter return of bison to YELL. As of May 9, when return operations began, there was no indication of eastward migratory behavior by the bison toward the Firehole Geyser Basin in the park.

The hazing operations conducted during the second and third weeks in May reduced the number of bison outside the park from 354 to less than 179. At the end of each of these weeks, it was thought that less than 30 bison remained outside the park. Hazing early in the season was conducted in a manner to combine all groups of bison that were encountered into progressively larger groups of bison and push them eastward into the park hoping they would all continue east toward the summer range. As in past years, the bison tended to spread out and divide into smaller groups when the hazing pressure was scaled back. From May 21 through May 25, the agencies focused efforts to haze about 210 bison that remained in an area along the Madison River west of 7-mile bridge (~110 bison) extending west through the South Fork/Flats area (~100 bison outside the park) south of the Madison Arm of the Lake. Twice during this week a portion of those bison circled back to the west after dark and required hazing back across the same terrain. In addition, MDOL requested to capture a group of 27 bison (12 adult females each with newborn calves and 3 three-year-old bison accompanying them) that were located near the Red Canyon Ranch (all or a portion of this group had attempted to migrate north up the canyon onto the National Forest and were turned around to keep them in the Zone 2 designated area) and move them back in to the park using stock trailers. This action took place on May 24 and all of the bison were released near the Ojo Caliente Spring trailhead.

Table 11.—Results of aerial surveys for Yellowstone bison in the western management area during spring 2012

Location	April 22	May 20
IBMP Zone 1	171	10
IBMP Zone 2	354	179
West of Madison Junction to 7-mile bridge	0	121
Total	525	310

The first week of hazing reduced the number of bison outside YELL in Montana from about 380 to 100 (Table 12). However, many bison hazed into YELL moved west and back into Montana during the next few weeks, primarily when hazing pressure ceased at night or on the weekends when no hazing was conducted. By the fifth week of hazing, only a few bison were located outside the park. However, several weeks later a group of more than 100 bison (including newborn calves) moved from the upper Madison Valley inside the park back westward to occupy areas of the South Fork and Horse Butte. Three days of hazing in late June were necessary to move this group back into the park.

Two domestic cows were brought to the Bar N Ranch in the Hebgen basin on or about April 26. Cattle were brought to the ranches along the South Fork on or about June 15 and to the ranch near Red Canyon on or about June 20.

Table 12.—Number of bison hazed from the Hebgen basin, Montana back toward or into YELL along the west boundary during May and June 2012.

Date	South Fork	Horse Butte	North of Grayling Arm	Inside Yellowstone NP
May 9	20	291	14	
May 10			58	
May 11	60			150
May 15		82	31	
May 16	104			35
May 17			31	103
May 18			31	
May 21	100			
May 22	75			
May 23	85			75
May 24			15	
May 25	52			
May 29			27	
May 30		120		100
May 31	12			237
Jun 1			5	
Jun 4	2			
Jun 5			3	
Jun 6			3	
Jun 11		19		
Jun 18	81			
Jun 19		26		
Jun 20	87			

The prevailing environmental conditions during winter 2012 resulted from approximately average snow pack and warmer than normal temperatures, especially in March and April (Figures 5 and 6, Appendix D/Table D1). The West Yellowstone SNOTEL site had measurable snow until April 23. Consistent overnight temperatures at or above freezing did not occur in May and June. Growing-degree-days (an index for plant growth rate) were advanced approximately one month this year compared to 2010 and 2011 (Figure 7) and flooding in the Madison Valley was minimal (Appendix D/Table D1). The low-lying meadows at 7-mile bridge and Madison Junction tend to flood when the river discharge at the park boundary is greater than 1,000 cubic feet per second. This year the river discharge reached this flood stage value only during May 15-17 and on May 27 (Appendix D/Table D1).

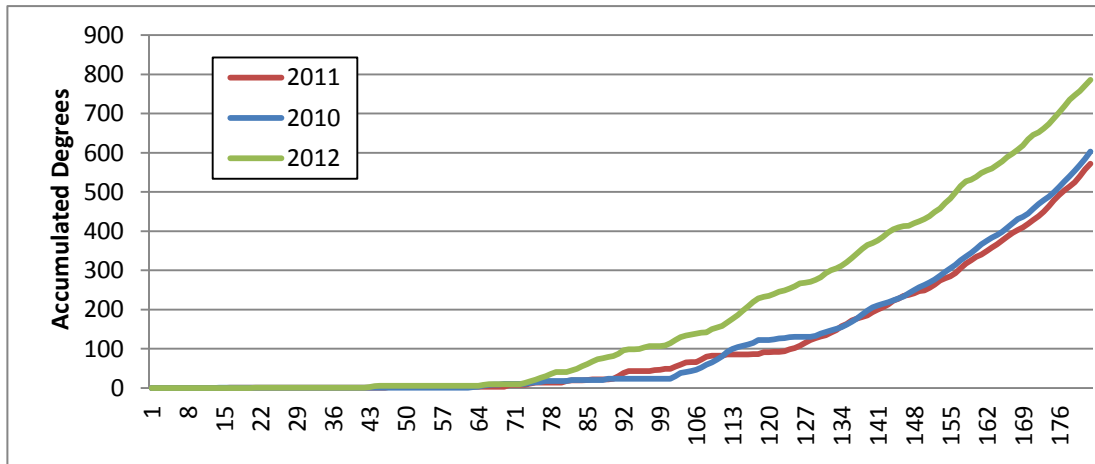


Figure 7.—Comparison of growing-degree-days for each year from January 1 through July 1 during 2010 to 2012. Growing-degree-days is an index of plant growth that uses high and low temperature data and accumulates information through the year to record a total temperature value. The x axis is Julian calendar dates in which May 1 = 122, June 1 = 152, and July 1 = 183.

Monitoring Metric 3: Annually review and apply *B. abortus* persistence information, private land cattle turn-on dates, and applicable research results to determine the effects of haze-to-habitat actions on bison and their effectiveness at preventing the commingling of bison and cattle (Lead = MDOL).

Bison were observed outside YELL as early as mid-December, but the majority of bison were outside the park between the end of March and the beginning of May, when the *Brucella* organism is known to have an environmental persistence of up to 44 days in materials deposited in April and 25 days in those deposited in May. Operations occurred on 20 days during that time period. Cattle were brought into the area on June 15, which is within the duration of persistence of the *Brucella* organism for that calendar date. Operations occurred on seven occasions in June, including two instances of removing bison from Zone 3 areas where cattle were present. Based on the intensive management operations conducted by the interagency partners, the risk of brucellosis transmission from bison to livestock in the Hebgen Basin was minimized.

Management Action 3.2d: Haze bison from the Gardiner basin into YELL with a target date of May 1.

Monitoring Metric 1: Consistent with management action 1.1b, assess the prevailing environmental conditions and reach consensus by April 15 on a step-wise, integrated plan for the end-of-winter return of bison into YELL from Zone 2 (Lead = MDOL/NPS).

Consensus was reached between the IBMP agencies by April 15 on a step-wise, integrated plan for the end-of-winter return of bison into YELL from Zone 2. However, few bison migrated beyond the boundary and there was no end-of-winter haze back operation.

Monitoring Metric 2: Annually document the timing of the end-of-winter return of bison into YELL, the number of bison returned, prevailing environmental conditions, and success or lack thereof of hazing bison and getting them to remain in the park (Lead = MDOL/NPS).

See action 1.1b, monitoring metric 2 for a complete list of numbers and locations of bison in the Northern Management Area for the 2011-2012 management season. Bison began occupying the Zone 2 area of the Gardiner Basin in late November, 2011, and sporadically used the area until early April. The maximum number of bison outside the park at one time was 44 in early March.

There was little movement by bison into the Gardiner basin through the winter due to relatively low accumulation of snow on the Blacktail Deer Plateau. By mid-December 2011 less than 20% of the northern herd and few bison from the central herd had migrated to the Blacktail Deer Plateau. There were approximately 30 bison in the

Gardiner Basin at this time. By mid-March, bison in northern Yellowstone were distributed widely across the Lamar Valley, Little America, Blacktail Deer Plateau, and Hellroaring slopes. However, snow had largely melted on the Blacktail Deer Plateau and in Little America by late March, and there were only 40 to 90 bison in the Gardiner Basin (in and outside the park) through late April. Only small groups of bull bison were seen in the Gardiner Basin during May

Monitoring Metric 3: Annually review and apply *B. abortus* persistence information, private land cattle turn-on dates, and applicable research results to determine the effects of haze-to-habitat actions on bison and their effectiveness at preventing the commingling of bison and cattle (Lead = MDOL).

Cattle turn-on dates were previously described for management action 1.3a. Bison were observed outside YELL as early as the end of November, but the majority of bison were outside the park in March. Only one operation occurred at the beginning of April to remove bison from a Zone 3 premises where livestock were present year round.

Annual Progress Report on Citizens' Working Group Recommendations

The following section provides the first annual progress report on recommendations presented to the IBMP Partners by a Citizens' Working Group (CWG). The 44 recommendations, which came as a result of 10 months of meetings, were presented to the Partners at the November 30, 2011 IBMP meeting. The Partners discussed and sometimes lumped, then adopted or rejected each recommendation during meetings on 24 February and 1 May 2012 (Table 13). Decision discussions can be found from meeting note archives (see <http://ibmp.info/meetings.php>). Note that this first "annual" progress report is (a) presented only 6 months from recommendation adoption, (b) shows only those recommendations that were adopted using original numbering, and (c) includes brief notes from Partner decisions.

Table 13.—Summary of Partner decisions on CWG recommendations from May 1, 2012 IBMP meeting.

Habitat Expansion / Effectiveness		Population Management (PM)		Risk Reduction	
CWG rec# for this category	Partner Decision	CWG rec# for this category	Partner Decision	CWG rec# for this category	Partner Decision
1	Accept	1	Same as/see Habitat 3di	1	Same as/see PM 13
2	Accept	2	Same as/see Habitat 1, 3e	2	Reject
3ai	3ai) Accept Horse Butte 3ai) Reject Flats	3a	Accept	3	Same as/see PM 14
3aii	Reject	3b	Accept*	4	Reject—see PM 13
3aiii	Accept as rewritten*	3c	Accept	5	Same as/see PM 15
3bi	Accept	3d	Accept*	6	Accept
3bii	Accept	3e	Accept	7	Reject Accept
3biii	No decision, but keep alive	3f	Accept	8	Cannot make decision
3ci	Reject	4	Accept	9	Same as/see PM15
3cii	Reject	5a-f	Accept (remove word "analysis" from CWG statement)	10	Same as/see PM 2; Habitat 1, 3e
3di	Accept	6a	Accept		
3dii	Accept	6b	Reject*		
3e	Same as/see Habitat 1	6c	Accept*		
		6d	Accept*		
		7	Reject		
		8	Accept*		
		9	Accept		
		10	Accept		
		11	Accept*; see notes from 050112 meeting		
		12	Accept		
		13	Reject per 112712 IBMP meeting		
		14	Accept*		
		15	Accept		
		16	Accept		

Habitat Effectiveness / Habitat Expansion

- * **Habitat Recommendation 1.—Identify public lands that could/should be open to bison year-round in accordance with state and federal law. (Lead = MFWP/USFS)**

Partner decision.—Accept

Discussion.—This work will be carried out under the State of MT Bison Management Plan, which is in progress and expected to be complete by 2015. The scoping process is expected to start soon.

2012 Report

- ☐ CWG habitat recommendations—reference habitat subcommittee responses/comments (table from summary report of 3/9/12) and also summarize on-going efforts (MFWP Environmental Assessments [EAs]).
- ☐ CWG Population recommendation #3 regarding use of fire, fertilizers or other habitat management—reference population subcommittee responses and comments.
- ☐ Gardiner and Hebgen Lake basins dependent upon 2011 adaptive management changes and current 2012 environmental assessment regarding proposed adaptive management changes in the Hebgen Basin, Taylor Fork, and Cabin Creek.

- * **Habitat Recommendation 2.—Systematically identify suitable, available habitat outside Yellowstone National Park in the Greater Yellowstone Area (i.e., Federal, State and Private lands). (Lead = MFWP, USFS)**

Partner decision.—Accept

Discussion.—Already underway by Habitat Subcommittee.

2012 Report

- ☐ Gardiner and Hebgen Lake basins dependent upon 2011 adaptive management changes and current 2012 environmental assessment regarding proposed adaptive management changes in the Hebgen Basin, Taylor Fork, and Cabin Creek.

- * **Habitat Recommendation 3ai-3aiii.—Develop and implement strategies that manage bison as wildlife on those lands, specifically:**

a. Hebgen Basin

- i. Designate Horse Butte Peninsula and the Flats as year-round bison habitat by May 2012 following an adequate public process for this management change. (Lead = MFWP/MDOL)*
- ~~*ii. By the end of 2012, interview and map landowners to identify where bison are welcome, unwelcome, which landowners are on the fence and what their reservations are.*~~
- iii. Investigate and come to conclusion on feasibility of fencing or acceptable alternatives on the Flats to prevent co-mingling with private livestock. (Lead = MFWP/MDOL)*

Partner decision.—(3ai) Move to rework

Discussion.—The Partners affirmed that their intention is that bison be allowed year-round on Horse Butte but will need to go through public process before implementing. Recommendation not accepted due to concerns about the Flats.

Partner decision.—(3aii) Reject

Discussion.—Private property owner concerns drive Partner decision. CWG states that one of their goals is to clarify/improve inaccuracies in current maps (e.g., maps label areas have no tolerance for bison when indeed they do).

Partner decision.—(3aiii) Reject as is, but Accept as rewritten to say, “Investigate and come to conclusion on feasibility of fencing or acceptable alternatives on the Flats to prevent co-mingling with private livestock.”

Discussion.—Subcommittees concern that due to heavy snow loads the ability to use fencing successfully in the Hebgen Basin is less certain than in the Gardner Basin.

From May and 2, 2012 meeting after clarification by CWG:

CWG: We would like bison to be able to use the Flats for the entire year.

Partners: We have not been successful managing bison movement on the Madison Arm. Bison do not stay east of the South Fork of the Madison; instead they go to the west side, at least for the last couple of years.

Partners: We prefer step-wise effort, starting with showing success of year around tolerance on Horse Butte and then potentially moving forward from there. Decision = accept year round tolerance of mixed groups on Horse Butte. MDOL and MFWP will take lead on an environmental review and determine final scope of the decision.

2012 Report

- ☐ 3ai).— Pending environmental assessment and IBMP management final decision. As of September 2012, MDOL and MFWP are in the process of conducting an environmental review for additional tolerance in this area.
- ☐ 3aiii).—In process. As of October 2012, MDOL, the Defenders of Wildlife and two landowners have committed to construct additional fencing in a South Fork area.

*** Habitat Recommendation 3bi-3biii.—Develop and implement strategies that manage bison as wildlife on those lands, specifically:**

b. Gardiner Basin

- i. By the end of 2012, interview and map landowners to identify where bison are welcome, unwelcome, which landowners are on the fence and what their reservations are. (Lead = NGOs with MFWP support)*
- ii. By the end of 2013, implement adequate fencing or acceptable alternatives. (Lead = NGOs with MFWP support)*
- iii. Following the interview process and implementation of fencing/alternative strategies, consider designating the Gardiner Basin year-round habitat using an adequate public process. (LEAD: none pending decision on State of MT Hebgen Basin EA decision)*

Partner decision.—(3bi) Accept

Discussion.—Subcommittees state this work is already complete.

Partner decision.—(3bii) Accept

Discussion.—Subcommittee accepts but considers of low priority.

Partner decision.—(3biii) Move to rework

Discussion.—Subcommittee statement that bison will not use the Gardiner Basin year-round. CWG counter that we haven't let them try, so how do we know? Obstacles identified for making decision: results from (1) State of MT EA on and pending legal actions against Gardner Basin adaptive management changes. Partners note that this recommendation hits at the very issue of current lawsuits and thus they cannot recommend on it until the lawsuits are resolved.

From May 1 and 2, 2012 meeting after clarification by CWG: Partners: 3biii will be kept alive pending State of MT Hebgen Basin EA outcome. >>

2012 Report

- ☐ 3bi).— NGO effort shifted to working with individual landowners interested in strategic fencing. NGOs are continuing their work with interested landowners.
- ☐ 3bii).—In process.
- ☐ 3biii).—NA.

*** Habitat Recommendation 3di-3dii.—Develop and implement strategies that manage bison as wildlife on those lands, specifically:**

c. Upper Gallatin/Taylor Fork/Cabin Creek/Porcupine/Buffalo Horn Creek, etc.

- i. Begin a public process to evaluate opportunities for reintroduction and management of bison in this area, including within Yellowstone National Park. (Lead = MFWP, USFS, MDOL)*

- ii. **Start work to amend/alter State and Federal Management Plans and other decisions to account for the presence of bison on the landscape and take responsibility/be accountable for successfully implementing those plans regarding bison. (Lead = MFWP)**

Partner decision.—(3di) Accept.

Discussion.—Recognized need to clarify the Zones (1,2,3) of the ROD.

Partner decision.—(3dii) Accept.

Discussion.—NA.

2012 Report

- ☐ 3di).—In process. As of September 2012, MDOL and MFWP are in the process of conducting an environmental review for additional tolerance in this area.
- ☐ 3dii).—In process.

Population Management

- * **Population Management Recommendation 3^{*}.**—(a) Make hunting a bigger component of bison management and consider different seasons or other opportunities to increase the impact of hunting. (Lead = MFWP, NPT, CSKT) (b) Outside the Park, the main means for controlling bison abundance and distribution should be state-administered and tribal hunting. Montana Fish, Wildlife and Parks should test new methods for dispersing hunting in time and space. (Lead = MFWP, NPT, CSKT) (c) A late-winter hunt for yearlings only should be tested for hunter interest and public acceptance. (Lead = MFWP, NPT, CSKT) (d) “Depredation” hunts should be available throughout the year and used to manage bison distribution. (Lead = MFWP, NPT, CSKT) (e) Other means of population control should include fencing bison out of areas where they are not welcome (Lead = MDOL), and (f) using fire, fertilizers or other habitat management to attract bison to areas where they are welcome (Lead = USFS). CWG desire: Lethal removal by agency personnel should be a last resort.

^{*}Note: labels (a) – (f) added by subcommittees

Partner decision.—(3a) Accept.

Discussion.—In progress.

Partner decision.—(3b [note two parts above]) Accept.

Discussion.—In progress. However, caveat that current ROD and court settlement established seroprevalence reduction as an IBMP priority, and hunting alone will not accomplish this goal, hence lethal removal of infectious animals remains an IBMP tool.³

Partner decision.—(3c) Accept.

Discussion.—NA.

Partner decision.—(3d) Accept.

Discussion.—In progress.

Partner decision.—(3e) Accept.

Discussion.—In progress.

Partner decision.—(3f) Accept.

Discussion.—**action item 2: request to CWG to provide specific habitat improvements that would help move bison to places they are not.

2012 Report

- ☐ 3(a).—In process. MFWP continues to collaborate with four aboriginal treaty hunting tribes to increase bison

³ This sentence removed per discussion at 050112 IBMP meeting. See notes for that meeting for explanation.

harvest through hunting. MFWP Commission approved game damage bison hunt roster process to further address bison hunting management tools outside the general season framework and hunt areas.

- ☐ 3(b).—MFWP continues to collaborate with four aboriginal treaty hunting tribes to increase bison harvest through hunting.
- ☐ 3(c).—MFWP continues to collaborate with four aboriginal treaty hunting tribes to increase bison harvest through hunting.
- ☐ 3(d).—MFWP Commission approved game damage bison hunt roster process to further address bison hunting management tools outside the general season framework and hunt areas.
- ☐ 3(e).—Nothing to report for this year.
- ☐ 3(f).— Nothing to report for this year.

*** Population Management Recommendation 4.—Montana Fish, Wildlife and Parks and the Tribes hunting Yellowstone bison should work more closely together to set collective hunt targets and to document the hunting success numbers. (Lead = MFWP, NPT, CSKT)**

Partner decision.—Accept.

Discussion.—Recognized hesitancy on behalf of tribes to commit to an absolute hunting limit—would they commit to one? Response—yes but should be based on population, population goals, and what is available to tribal hunters. CWG request that 1) Partners switch emphasis from how many do we take to how many do we leave, and 2) recognition that hunting changes behavior (e.g., migration patterns, where new groups might establish themselves).

2012 Report

- ☐ In process. MFWP continues to collaborate with four aboriginal treaty hunting tribes to increase bison harvest through hunting. This collaboration includes discussion of population goals.

*** Population Management Recommendation 5a-5f*.—Agree on and establish a target population range that is biologically and ecologically acceptable and accounts for a variety of public interests. As Interagency Bison Management Partners, agree on criteria for evaluating and determining a population range and appropriate management tools, such as: (Lead = Partners)**

- a. Winter range outside the Park (target population range could change to reflect changes in habitat availability),**
- b. Risk factors-**
- c. Individual agency management mandates, constraints and responsibilities (such as the National Park Service's mandate to manage its resources unimpaired for future generation and its natural regulation policy),**
- d. Genetic diversity, population structure and demographics, reproduction, and distribution,**
- e. Realistic opportunity for addressing private land owners' concerns, and**
- f. Hunting and wildlife viewing opportunities.**

Partner decision.—(5a-f) Accept as rewritten to say, "The Partners will use 5(a-f) in future population number determination using 3000 as a guideline, not a target."

Discussion.—Partners—Population target of 3000 exists in the ROD and took into account factors listed. CWG feels that 1) no one knows what 3000 means and how to adaptively manage (i.e., change) that goal (thus, the request for a population range), 2) concern over 3000 is the genetic brink and thus a great danger for long-term bison viability, and 3) that much has changed since the completion of the ROD .

From May 1 and 2, 2012 meeting after clarification by CWG: Partners: We have interest in this concept and support a peer reviewed study of literature of bison population and genetic viability. We would be interested in seeing the work completed by an unbiased group made up of members of both conservation and livestock communities. Decision: Yes, Partners will support this recommendation as they reworded it previously, but additionally support the idea of a literature review as noted. The Partners explicitly stated that they were supporting a literature review, not an "analysis" as described in the CWG note shown directly above.

2012 Report

- ☐ 5(a).—The potential for winter range outside the Park is being explored in an environmental analysis (EA; carried out under the Montana Environmental Policy Act) looking at year-round bison tolerance on the Taylor Fork, upper Gallatin, and broader Hebgen Basin.
- ☐ 5(b).—Risk factors are under consideration as part of the EA.
- ☐ 5(c).—NPS staff and colleagues published a scientific article (Plumb et al. 2009) in the journal *Biological Conservation* summarizing analyses of the population range that should satisfy the collective long-term interests of stakeholders as a balance between the park's forage base, conservation of the genetic integrity of the bison population, protection of their migratory tendencies, brucellosis risk management, and other societal constraints related to management of bison. A summary of these findings was included in the 2011 IBMP annual report.
- ☐ 5(d).—NPS staff and colleagues published a scientific article (Pérez-Figueroa et al. 2012) that evaluated the effects of variance in male reproductive success and annual variations in population size due to culling on the maintenance of genetic diversity in Yellowstone bison. Maintenance of 95% of allelic diversity is likely to be achieved with a fluctuating population size that increases to greater than 3,500 bison and averages around 3,000 bison. A summary of these findings was included in the 2011 IBMP annual report.
- ☐ 5(e).—Landowner concerns were documented at scoping meetings held August 20th in West Yellowstone, and August 21st in Gardiner. In addition, Partners met with landowners and listened to their concerns during a day-long tour of the Taylor Fork Basin.
- ☐ 5(f).—Nothing to report.

*** Population Management Recommendation 6a-6d.—When bison have to be removed because of high migration numbers, management constraints, safety, etc., the priorities should be (in order):**

- a. Hunting outside the park, (Lead = MFWP)**
- ~~b. Moving them to nearby appropriate available lands,~~**
- c. Translocation from the Yellowstone area (capture, quarantine, transport and release), and (Lead = NPS, MDOL, APHIS)**
- d. Lethal removal by managing agencies. (Lead = MDOL)**

Partner decision.—(6a) Accept.

Discussion.—In progress. Tribes would like to see hunting available every year and a move away from the idea that moving bison is necessary (i.e., hunting could be the main population control).

Partner decision.—(6b) Reject.

Discussion.—Moving (hazing) and translocation (capture and move) are recognized to not be effective tools for long-term population management. They are, however, in the short term a tool managers need at their disposal.

Partner decision.—(6c) Accept (note: post quarantine bison only).

Discussion.—NA.

Partner decision.—(6d) Accept (note: same note as in 3b discussion above applies regarding seroprevalence)

Discussion.—NA.

2012 Report

- ☐ The NPS developed a management plan recommending the removal of approximately 450 bison during winter 2013 through public and tribal hunting in Montana, transport of likely infectious bison to slaughter, and the transfer of bison to quarantine or research facilities. The primary management tool used to reduce bison numbers is public and treaty harvests in Montana. However, additional bison may be captured at boundary facilities and removed from the population after general hunting seasons end in mid-February if necessary to reach removal objectives for that year. These bison may be selectively culled (shipment to slaughter) to reduce the proportion of infectious bison, transferred to research facilities, or transferred to quarantine facilities for further testing and eventual release of brucellosis-free animals. In September 2012, the NPS signed an agreement with the ITBC that sets forth the roles and responsibilities of the parties regarding the transfer of bison from Yellowstone National Park to the ITBC for transport directly to slaughter facilities and subsequent distribution of meat, hides, horns, and other bison parts to support the nutrition and culture of American Indian tribes.
- ☐ 6(a).—In process. MFWP continues to look for every opportunity to use hunting as a primary management tool.

- ☐ 6(c).— MDOL will coordinate with NPS to ensure that relocated bison do not pose a brucellosis transmission risk or jeopardize the brucellosis status of the state of Montana.
- ☐ 6(d).—While lethal removal remains as one of the tools in the IBMP, other options must be exhausted before lethal removal for population control will be employed.

*** Population Management Recommendation 8.—In order to locate bison to lands elsewhere, Montana should develop and implement a translocation process for bison leaving quarantine. The quarantine process should minimize infrastructure requirements for places receiving bison. (Lead = MFWP, MDOL, APHIS, NPS)**

Partner decision.—Accept with the following modification to the second line: “The quarantine process should use the minimum containment infrastructure necessary for places receiving bison.”

Discussion.—In progress.

2012 Report

- ☐ It is apparent from the attempts to place bison graduating from the quarantine facility that the translocation process originally described in the Quarantine Feasibility Study is not suitable—because of lack of suitable potential sites and extreme public controversy about any potential sites. The translocation process to date has been that described in the EA for Phase II/III of the quarantine feasibility study—that is to solicit proposals for translocation of the quarantine bison. A modification to that is the requirement the bison be held in a manner that they can be captured and monitored for brucellosis over a 5-year period. Because of the recommendation that the initial Quarantine Feasibility Study bison be held and monitored for five years after leaving the facility, and because of the extreme controversy surrounding relocation of the Quarantine Feasibility Study bison, infrastructure requirements have been significant. Upon successful completion of the Quarantine Feasibility Study, assuming all bison continue to test negative, future quarantine bison could be translocated to areas with minimal infrastructure if that area was approved for such a translocation. Because of the intense socio-political concerns about free-roaming bison, additional planning and coordination efforts are required before bison can be translocated to new locations (at least in Montana).
- ☐ Also, please see Population Management recommendation 6a-d above.
- ☐ During 2012 the Secretary of the Interior directed staff to begin consultation with the Tribes to identify and evaluate opportunities for relocations of brucellosis-free Yellowstone bison to tribal lands. He also directed the NPS to explore developing and operating additional quarantine facilities for Yellowstone bison. NPS staff at YELL are developing a protocol in collaboration with the other IBMP agencies that outlines roles and responsibilities that will apply when live Yellowstone bison are transferred from the NPS to American Indian tribes or other organizations. This protocol should be completed during 2013. The NPS is also consulting with the 26 Tribes associated with YELL and exploring options for operational quarantine in collaboration with the Bureau of Indian Affairs.

*** Population Management Recommendation 9.—Determining where bison completing quarantine will go and how they will be restored and conserved on the landscape, with the highest priority on managing them as public and tribal wildlife, must precede capturing bison and implementing quarantine. Recipients of quarantined bison must be identified and an acceptable, appropriate translocation process must be in place prior to quarantining Yellowstone bison. This determination of where bison will go should be integrated with all Fish, Wildlife and Parks or other assessments of relocation possibilities for wild bison in Montana. (Lead = MFWP, NPS)**

Partner decision.—Accept.

Discussion.—In progress.

2012 Report

- ☐ MFWP initiated a statewide bison management planning effort in 2012 to determine if there are suitable locations for restoration of bison in Montana. To prepare a statewide bison management plan, Montana Fish, Wildlife & Parks is moving forward with the development of a programmatic environmental impact statement to address the potential for bison restoration in Montana. The EIS will examine an array of possible alternatives from a no action alternative to a number of different bison restoration alternatives and the potential impacts of those alternatives. A scoping effort was conducted during summer 2012, resulting in a significant level of interest and number of comments. Comments have been summarized; based on those comments potential sites where further analysis will be conducted are being determined. A summary of comments can be found on MFWP’s website at: <http://fwp.mt.gov/fishAndWildlife/management/bison/>.

- In 2011, the Director of the NPS unveiled a Call to Action initiative which, in part, calls for returning American bison to our country's landscape by restoring and sustaining three wild bison populations across the central and western United States in collaboration with the Tribes, private landowners, and other public management agencies. In addition, during 2012 the Secretary of the Interior directed staff to begin consultation with the Tribes to identify and evaluate opportunities for relocations of brucellosis-free Yellowstone bison to tribal lands. NPS staff at YELL are participating in both these efforts.

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- * **Population Management Recommendation 10.—Bison translocation and bison movement should not include moving seropositive animals outside the current DSA, and may preclude relocating seropositive animals to new areas within the DSA with the intent of establishing new herd ranges. The intent is to avoid establishing new sources of disease and new disease risks to cattle. (Lead = MDOL)**

Partner decision.—Accept.

Discussion.—Partners agreed to recommendation but not the “clarification” noted in the Population Management Subcommittee’s spreadsheet (Appendix B).

2012 Report

- No report for this year. Partner note: it is impractical to move Quarantine Feasibility Study seronegative bison to an area within the DSA where they could become re-infected.

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- * **Population Management Recommendation 11.—Hazing of bulls should be minimized, unless there are issues with property damage or safety, because they are not a factor in the issue of brucellosis transmission. Hazing of newborn calves should be minimized for humane reasons. (Lead = MDOL, MFWP)**

Partner decision.—Accept. (Partner clarification: accepting this recommendation is not equivalent to saying bull bison are allowed anywhere at any time.)

*Discussion.—Partners asked for clarification from the CWG on this question: Did they mean within current tolerance areas or did they mean regardless of current zone system? Response = 1) If we are within the current tolerance zones bison are already allowed; the recommendation meant anywhere in space and time regardless of zone with recognition that safety and other qualifies still exist. Partners—not sure we can do that (tolerance outside allowed Zones) without MEPA process. **action item 3: Partners request greater clarification from CWG on what is meant by recommendation 11.*

From May 1 and 2, 2012 meeting after clarification by CWG:

Partners: asked if the CWG was requesting that bison be tolerated outside of currently allowed zones.

CWG: Noted that they had provided related recommendations under Population #1 and Habitat #1,2,3. Population #11 does not mean anywhere but instead means bulls should be able to move wherever, whenever they want in the Hebgen and Gardner basins given the caveats of public safety and similar, regardless of current zone designations.

Partners: This might be logistically difficult since bison often move in mixed groups so it would be difficult to separate the bulls out for increased tolerance. A concern was expressed that bachelor bison are exploratory and can lead females to wander more widely.

CWG: We see lone bulls mostly keeping to themselves and not exploring new habitat. Instead, females lead in habitat recruitment.

Partners: Some concern about this proposed increase in tolerance when the details of prevalence reduction are not yet set forth.

Partners/CWG: Some discussion around the difficulty in understanding what each person/group means by “Hebgen Basin” and “Gardner Basin” (actual watersheds or something else?). The terms “northern” and “western management areas”, as used in the Adaptive Management Plan, seemed more appropriate to most. A shared Partner/CWG mapping exercise was considered, but then set aside in realization that such an exercise would be required in the MEPA/NEPA process shortly upcoming.

Partners: Yes we agree to minimum hazing of bull bison but again, we want to clarify if you explicitly mean that bulls should be free to wander wherever, whenever they want.

CWG: Yes, we meant in space and time.

Partners: The EA on expanded tolerance will address the Hebgen Basin and Upper Gallatin but not beyond. (see section in this report titled “Status of Potential EA for Additional Bison Habitat”).

Partner-to-Partner questions:

What is the relation of this EA to the state-wide bison plan? Response: the EA does nothing to preclude the statewide effort.

Does this proposed action include the full Hebgen Basin? Response: We don't know.

Should we expand the EA to include mixed groups in the broader area (full basin)? Response: We don't know.

Then what is the area that will be included in the EA? We don't know. This will be determined by MDOL and MFWP in the days ahead.

CWG: A reminder that one of the CWG sideboards was that they not be allowed where they could impact cattle.

2012 Report

- ☐ In process.

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- * **Population Management Recommendation 12.—Discuss expected adverse weather events (similar to fire management) and work with involved entities (public and private) to develop and agree on contingency plans. (Lead = Partners)**

Partner decision.—Accept.

Discussion.—In progress. Recognition by all that advances in weather prediction tools are a great benefit to predicting bison movement for short term (e.g., month-to-month rather year-by-year) adaptive management changes more in.

2012 Report

- ☐ In process.
- ☐ NPS staff and colleagues published a scientific article (Geremia et al. 2011) summarizing analyses of the relationships between bison population size, accumulated snow pack, aboveground dried biomass, and the number of bison migrating to the boundary of YELL. During June and early July, the NPS conducts counts and age and gender classifications of bison in the central and northern breeding herds. The NPS uses long-term weather forecasts and population and migration models to predict herd abundances and compositions at the end of the upcoming winter, and the magnitude of numbers of bison migrating to park boundaries. They establish annual removal objectives for bison based on abundance, disease, distribution, and demographic (age, herd, sex) goals. These analyses and objectives are shared with the other IBMP agencies for their consideration (e.g., refining harvest quotas) and comment. As winter progresses, the NPS uses aerial and ground counts, snow model projections for the park, and revised long-term weather forecasts to refine predictions of the timing and magnitude of trans-boundary movements by bison and support decision-making during winter operations.

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- * **Population Management Recommendation 13.—Develop and work with the livestock industry to implement an effective cattle vaccine and protocol to reduce the risk of transmission and make bison presence/translocation more acceptable. Support/secure funding for ongoing vaccine research. (Lead = APHIS, MDOL)**

Partner decision.—Accept improvement of current protocol. Reject support for vaccine research.

*Discussion.—Partners: 1) work with livestock industry is a yes and in progress; 2) reality is that brucellosis impacts one discrete part of country and thus there will not be funds available for vaccine research nor will it be a primary goal for IBMP Partners (suggestion of \$5M for finding agreeable deployment method, \$15M finding a new vaccine); 3) CWG overestimating power of Partners in thinking they can override funding and/or Homeland Security challenge to getting new vaccine research undertaken. CWG: 1) Why is research always on sero+ animals not on sero- animals to understand why they are sero-? 2) But vaccine important not just for livestock protection against sero+ bison, but also sero+ elk, which is the real issue; how can we let elk run loose unencumbered and state no tolerance for bison?—it is thus illogical to say both no to vaccine and no to change in bison tolerance; 3) key focus of CWG is to focus on protection of cattle not management/vaccination of bison. **action item 4—RC suggests Partners have Steve Olsen to give pre-meeting seminar on issues of elk and brucellosis.*

From May 1,2 2012 meeting after clarification by CWG: Partners: Decision = change our “reject” to “accept” of this recommendation but defer any action until Partners and CWG listen to the discussion from Steve Olsen (see action item 2).”

2012 Report

- ☐ Steve Olsen will provide presentation at the November 2012 IBMP meeting.

- ☐ MDOL is engaged with USDA researchers to keep improving the available vaccine and protocol for administration. MDOL continues to support USDA's efforts in continuing brucellosis research.
- ☐ This recommendation rejected following Steve Olsen 27 November 2012 presentation and can be removed in subsequent years.

*** Population Management Recommendation 14.—Lobby for removing the significant barriers that exist for *Brucella abortus* research because of the select agent listing. (Lead = Lead Partner that year)**

Partner decision.—Accept.

*Discussion.—Partners: two members have made concerted effort, but issue comes down to public health groups; Senator Baucus also made an attempt but result of all efforts remains CDC say not coming off; believe this effort would be stronger coming from a grass roots citizens' coalition. CWG: Can Partners write a letter or in some way (e.g., letter to representatives) affirm their interest for the CWG to use in their lobbying efforts? **action item 5—Partners agree to write a letter to representatives stating their support for removing the significant barriers that exist for *Brucella abortus* research because of the select agent listing.*

2012 Report

- ☐ In process. In May 2012, the Partners (excluding APHIS) signed a letter urging Montana's Congressional delegation to ask the Centers for Disease Control to move to a tiered approach when classifying *B. abortus* to allow research to more readily proceed. In July 2012, the USDA-APHIS and CDC responded via letter to Senator John Tester that it was unlikely *Brucella abortus* would be removed from the select agent list.

*** Population Management Recommendation 15.—Develop and implement a strong, factual education component so an informed public is involved in the discussions. (Lead = Lead Partner that year)**

Partner decision.—Agreed.

*Discussion.—**action item 6—to be added to a future IBMP meeting.*

2012 Report

- ☐ In process. A committee was formed and met several times. A series of brochures are in progress and a new web page on the ibmp web portal is planned.

*** Population Management Recommendation 16.—Outside the Park, hazing and removals should be minimized in selected, suitable areas to establish year-round populations of Montana bison. This approach should be pursued incrementally in a “learn as we go” fashion. This will be a public process that identifies the boundaries of the area and a contingency plan if bison leave that area. (Lead = MDOL, MFWP)**

Partner decision.—Accept.

Discussion.—Partners added a clarification that they are voting yes (accept) on the recommendation provided by the Subcommittee in their spreadsheet (Appendix B), not on the qualifier provided in the same spreadsheet for this CWG recommendation.

2012 Report

- ☐ In process. Contingent upon approval of adaptive management changes and current environmental assessment. See comments above regarding the environmental assessment for additional tolerance of bison in the Northern and Western Management areas begun in August-September 2012.

Risk Reduction

*** Risk Reduction Recommendation 4.—~~(a) Strongly encourage continued funding and research to develop a practical test on live animals to distinguish between infected and resistant animals.~~ (b) Given the epidemiological importance of building ‘herd immunity,’ it is important to develop the tools to allow us to stop managing animals as if seropositive is equivalent to ‘infectious.’**

*Note: labels (a), (b) added by Partners

Partner decision.—(4a) Reject.

Discussion.— CWG: 1) some animals that are sero+ may be resistant to disease ; 2) note some work being done at Texas A&M on this question. Partners: 1) we lack technology to differentiate (i) animals that are resistant versus susceptible to disease and (ii) seropositive animals from shedders; 2) indeed some animals get exposed but are not infected but we see that number to be very small; 3) we do not agree that some animals are resistant to brucellosis; 4) we see high seroprevalence means most infected—issue is that some will shed and some will not. (LEAD = APHIS to set up talk with Steve Olsen)

Partner decision.—(4b) Accept. (LEAD = APHIS, NPS secondary)

Discussion.—NA.

From May 1 and 2, 2012 meeting after clarification by CWG: Partners: Yes, discussion from Steve Olsen planned.

2012 Report

- ☐ Steve Olsen will provide presentation at the November 2012 IBMP meeting.
- ☐ Results of a study by NPS staff and colleagues (Treanor et al. 2011) that integrated age-specific serology and *Brucella abortus* culture results from slaughtered Yellowstone bison to estimate probabilities of active brucellosis infection were published in the *Journal of Applied Ecology* (Treanor et al. 2011). Infection probabilities were associated with age in young bison (0-5 years old) and with elevated antibody levels in older bison (>5 years old). Results indicated that Yellowstone bison acquire *Brucella abortus* infection early in life but typically recover as they grow older. A tool was developed to allow bison management to better reflect the probability that particular animals are infective, with the aim of conserving Yellowstone bison while reducing the risk of brucellosis transmission to cattle. The highly sensitive Fluorescent Polarization Assay (FPA) provides quantitative diagnostic results that can be used in conjunction with bison age to identify actively infected animals with a high level of certainty. Using the FPA to estimate active infection works best for older bison (5+ with all permanent teeth), with a net value greater than 150 mP (above negative control) for female bison 3+ years old suggesting active infection. Most bison less than 3 years old that test seropositive are also culture positive, with live bacteria in their tissues. A high net FPA value for this age group would be greater than 50 mP (above negative control), which might be used in circumstances when there are more seropositive bison less than 3 years old than can be removed from the population due to conservation concerns.
- ☐ This recommendation rejected following Steve Olsen 27 November 2012 presentation and can be removed in subsequent years.

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- * **Risk Reduction Recommendation 6.—Reduce livestock/wildlife interactions at key seasons. This will include building upon and improving techniques already in use as well testing and application of other innovations (e.g. strategic hazing using low-stress animal handling methods; targeted fencing; guard dogs to keep wildlife off feedlines/haystacks/calving areas; trained dogs to locate fetal material to enable cleanup, and so forth). (Lead = CWG)**

Partner decision.—Move to rework.

Discussion.—Partners: decreasing interactions very important. However not realistic as this is not our job. Obstacles identified: 1) funding to support, 2) who handles, trains, etc dogs? 3) what would it look like (e.g., use APHIS guard dogs?)? 4) more specificity asked from the CWG.

*From May 1 and 2, 2012 meeting after clarification by CWG: Partners: Not sure about the likely success of dogs (or something else?) working with bison. This would be a new area of study. To implement such ideas, we would need to find a willing landowner(s). PF noted that the Wildlife Conservation Society has done some work with dogs and that he would contact Keith Aune to ask him about it (** action item 4). A note was made that in the Taylor Fork there are a number of horses so bison/horse interactions must also be considered. Decision: Partners accept this recommendation but state that they cannot be the lead for the work.*

2012 Report

- ☐ There is a lot of interest here, but no significant updates to report.

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- * **Risk Reduction Recommendation 8.—Remote vaccination of wild bison using the current vaccine and delivery method as a means of reducing risk of transmission should not be a priority at this time. (Lead = None pending outcome of EIS)**

Partner decision.—Cannot make decision.

Discussion.—EIS is in progress. Partners cannot make a declaration of intent on this CWG Recommendation as it would be pre-decisional to the EIS.

2012 Report

- NPS staff continued evaluations regarding whether to remotely vaccinate free-ranging bison inside YELL for brucellosis using a rifle-delivered bullet with a vaccine payload. Several factors suggested that the implementation of remote delivery vaccination at this time may not achieve desired results (>50% reduction in prevalence) and could have unintended adverse effects to bison, other wildlife, and visitor experience. To develop a lasting solution, the NPS is seeking input from independent scientists regarding the feasibility and sustainability of brucellosis suppression without significantly affecting bison behavior or visitor experience. A brucellosis science workshop, co-chaired by a representative from MFWP, is being organized for early 2013 to integrate science into a brucellosis management program that considers all stakeholder perspectives. Invited expert panelists will be asked to provide input on how brucellosis prevalence in Yellowstone bison could be reduced, as well as to identify critical knowledge gaps and research priorities that could improve brucellosis management practices. A report will be produced during 2013. Release of the final EIS evaluating whether to remotely vaccinate free-ranging bison inside YELL has been postponed until this input is received and evaluated.

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Appendix A: Bison breaches to record of decision and adaptive management plan in West Management Area for the 2011-2012 management season

Table A1.—Bison numbers and locations in the Western Management Area for the 2011-2012 management season.

Date	Number of Bison	Location of Bison	Hazing Operation
12/13	16 mixed	Horse Butte Subdivisions	No
12/20	16 mixed	Horse Butte Subdivisions	No
12/22	29 mixed	South Madison management area "flats"	No
12/27	16 mixed	Yellowstone Ranch Preserve	No
1/20	3 mixed	South Madison management area "flats"	No
3/8	30 mixed	Horse Butte	No
3/20	31 mixed	Horse Butte	No
3/26	30 mixed	South Madison management area "flats"	No
	203 mixed	Horse Butte	No
	7 mixed	Horse Butte Subdivisions	No
	30 mixed	Yellowstone Ranch Preserve	No
3/29	206 mixed	Horse Butte	No
	127 mixed	Horse Butte Subdivisions	No
4/2	287 mixed	Horse Butte	No
	30 mixed	Horse Butte Subdivisions	No
	91 mixed	Yellowstone Ranch Preserve	No
4/5	83 mixed	Horse Butte	No
4/8	146 mixed	Horse Butte	No
4/9	168 mixed	Horse Butte Subdivisions	No
	110 mixed	Yellowstone Ranch Preserve	No
4/10	39 mixed	South Fork Zone 3	No
4/11	34 mixed	South Fork Zone 3	Yes
4/13	101 mixed	Horse Butte	No
4/16	73 mixed	South Fork Zone 3	Yes
4/17	11 mixed	South Fork Zone 3	Yes
4/18	99 mixed	South Fork Zone 3	Yes
4/19	17 mixed	North Side Zone 3	Yes
4/20	33 mixed	South Fork Zone 3	Yes
4/22	117 mixed	South Fork Zone 3	Yes
4/23	103 mixed	South Fork Zone 3	Yes
	12 mixed	North Side Zone 3	Yes
4/24	49 mixed	South Fork Zone 3	Yes
4/26	24 mixed	Madison River North "flats"	No
	52 mixed	Horse butte	No
	5 mixed	Crossing Narrows	No
	166 mixed	Horse Butte Subdivisions	No
	80 mixed	Yellowstone Ranch Preserve	No
	29 mixed	North Duck Creek management area	No
4/30	72 mixed	South Fork Zone 3	Yes
5/1	55 mixed	North Duck Creek management area	Yes
5/2	38 mixed	South Fork Zone 3	Yes
5/3	31 mixed	North Duck Creek management area	Yes
5/4	30 mixed	South Fork Zone 3	Yes
5/7	8 mixed	South Fork Zone 3	Yes
	29 mixed	South Duck Creek	Yes
5/8	9 mixed	South Fork Zone 3	Yes
5/9	271 mixed	Horse Butte	Yes

Table A1.—Bison numbers and locations in the Western Management Area for the 2011-2012 management season.

Date	Number of Bison	Location of Bison	Hazing Operation
5/11	150 mixed	Madison River North "flats"	Yes
	30 mixed	South Madison management area "flats"	Yes
5/17	35 mixed	Madison River North "flats"	Yes
	68 mixed	South Madison management area "flats"	Yes
5/29	27 mixed	North Duck Creek management area	Yes
6/1	7 mixed	North Duck Creek management area	Yes
6/4	2 bulls	South Fork Zone 3	Yes
6/5	3 bulls	North Duck Creek management area	Yes
6/18	66 mixed	South Madison management area "flats"	Yes
	7 bulls	South Fork Zone 3	Yes
6/19	37 mixed	Horse Butte Subdivisions	Yes
6/20	77 mixed	South Madison management area "flats"	Yes
	10 mixed	South Fork Zone 3	Yes
7/3	1 bull	North Side Zone 3	Yes

Appendix B: Log of incidents responded to by MFWP Wardens, Nov 2011 through Aug 2012

MFWP reported 447 responses to IBMP-related matters between Nov2011 and Aug2012. Details of those incidents and responses are provided chronologically in Table B1.

Table B1.—Log of incidents responded to by MFWP Wardens from Nov 2011 through Aug 2012.

Officer	Date	Landowner or Contact	Address	Concern	Public Safety (PS), Hazing (H), Property Damage (PD)			Action Taken
					PS	H	PD	
					26	172	63	
Sheppard	15-Nov-11	Nancy Graile 223-3819, 848-2434	1075 Hwy 89 South	public safety and Property damage requesting financial assistance with fencing her property	1		1	Discussed potential of assisting financially with fencing costs. Problem with her fence design using 48 inch woven wire on the bottom, issue with other wildlife impacts such as antelope migration.
Sheppard	15-Nov-11	Matt Skogland NRDC	Livingston	Talk about bison fencing outreach project				Sent invoice for fencing costs 3790.00
Sheppard	15-Nov-11	Tony Novack	Helena RTR Fencing Contractor	talk about RTR Fence put up scheduled for Jan 1, 2012				Put together list of fence issues and adjustments needed
Sheppard	15-Nov-11	Wade Peck	RTR	irrigation pipe marking for fencing contractor				left message
Sheppard	16-Nov-11	Nancy Graile	1075 Hwy 89 South	question regarding maintenance and repair of fence	1		1	discussion with Pat will return call
Sheppard	16-Nov-11	Norman Milman	9 Saddle Ridge Rd Gardiner	reimbursement for damage, and talk about a fence he has constructed			1	Called back, left message. 1:25pm
Sheppard	16-Nov-11	Wade Peck	RTR	returned call, will mark irrigation pipe areas for contractor.				

Table B1.—Log of incidents responded to by MFWP Wardens from Nov 2011 through Aug 2012.

Officer	Date	Landowner or Contact	Address	Concern	Public Safety (PS), Hazing (H), Property Damage (PD)			Action Taken
					PS 26	H 172	PD 63	
Sheppard	16-Nov-11	Norman Milman	9 Saddle Ridge Rd Gardiner	wants payment for broken lawn furniture. Wants payment for fence for his fence.	1		1	Talked with him told him we would get back to him on if it was possible for reimbursement. Would like to get \$2000.00. told him it would be up to the NGO's
Sheppard	17-Nov-11	Cavin Fitzsimmons	USFS	Bison Hunt closure in WY				called him back, will review with Pat and Howard and get back to him.
Sheppard	21-Nov-11	Gary Cooper	Billings	Bison Hunt questions.				Answered questions.
Sheppard	28-Nov-11	BFC	West	Nez Perce Tribal hunting regs request				having document scanned and then A. Jones will respond to BFC and give them the information
Sheppard	28-Nov-11	Smolz	West Yellowstone	West Yellowstone proposed safety zone USFS	1			Discussed Smolz take on proposed safety zone. Hwy related parking issues.
Sheppard	28-Nov-11	CSKT Germaine White	Pablo	hunt updates				hunt updates
Sheppard	29-Nov-11	Tony Novack	Helena RTR Fencing Contractor	wants to put up fence on Dec 9th 2011. needs particulars on changes or repair			1	Provided Tony with general information will provide details and photographs of specific needs
Sheppard	30-Nov-11	IBMP meeting	Chico Hot Springs Emigrant	quarterly meetings	1	1	1	participation
Sheppard	1-Dec-11	IBMP meeting	Chico					Participation
Miller	2-Dec-11	Todd Koel		bison fence			1	discussed problems
Sheppard	2-Dec-11	Jim Miller	Emigrant	Discuss Gardiner Basin Bison outreach	1	1	1	
Sheppard	2-Dec-11	Tony Novack	Helena	RTR fencing contractor			1	sent off RTR fencing specs
Sheppard	2-Dec-11	Ray Stocks	MDOT	Bozeman	1	1	1	sent off Gardiner basin encroachment permit information and photos
Miller	3-Dec-11	Lorraine Miller	848-7452	bison eating trees/talked with 31			1	dropped off panels
Miller	3-Dec-11	Todd Koel		fencing			1	discussed problems
Miller	3-Dec-11	Todd Koel		fencing			1	discussed problems
Sheppard	4-Dec-11	Miller	Gardiner	1 bull bison out down near Corwin				advised Miller to close Yankee Jim gates and monitor
Sheppard	5-Dec-11	Jack Floyd	trout creek	cow/calf roster question				confirmed he was #22
Sheppard	5-Dec-11	Germaine White	CSKT	weekly update check in, tribal hunters found only 20 in horse butte homeowners association				told her Julie is headed out today to get a count

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					26	172	63	
Sheppard	5-Dec-11	Ron Saunders	Wise River	BFC hazing and interfering with his hunt		1		Called him back, what he described is not hunter harassment, merely BFC field presence.
Sheppard	5-Dec-11	Jim Miller	Emigrant	Informed us that the gates at Yankee Jim have been closed.	1	1	1	Gates have been closed and locked
Sheppard	6-Dec-11	CSKT, CTU, SB, NP		Bison field report				sent biological survey information
Sheppard	7-Dec-11	Mauray Miller	Gardiner	additional fencing request for fence near trees on property. She is part of area we already fenced with NGOs			1	sent down 8 4' x 8' hog wire panels to be placed to protect tree portion of fencing. Miller will deliver.
Knarr	8-Dec-11	Maurey Miller	Gardiner	Fencing material	1		1	loaded hog panel into 38's truck to take to 313
Sheppard	8-Dec-11	Tony Novack	Helena	discuss RTR fence repair needs and logistics		1	1	Novack will be on site on Dec 9 2011 to put up fence and address RTR concerns.
Knarr	9-Dec-11	Maurey Miller	Gardiner	making sure 313 delivered fencing	1		1	call to 313
Miller	9-Dec-11	Peter Schmitt	30734426 41	bison on property			1	Phone Call
Miller	9-Dec-11	Alan Shaw		fencing at RTR			1	visited sites of concern
Miller	9-Dec-11	Alan Shaw		fencing at RTR			1	discussed problems
Miller	9-Dec-11	Alan Shaw		panels for tree protection			1	discussed problems
Miller	9-Dec-11	Wade Peck		fencing at RTR			1	discussed problems
Smolczynski	12-Dec-11	bison hunter	wyell	calling about bison movement				discussion of landscape
Smolczynski	12-Dec-11	bison patrol	horse butte and madison river	collect bison numbers and move				routine patrol
Sheppard	14-Dec-11	Tribal update		sent most recent update info to the tribes regarding bison availability associated with the hunt.				
Sheppard	14-Dec-11	Scott Bischke	Bozeman	resent RTR operations plan and signature page				
Smolczynski	14-Dec-11	bison hunter	wyell	calling about bison movement				no bison on landscape
Sheppard	15-Dec-11	Mauray Miller	Gardiner	wanted to thank us for the hog panels wants more or a source where she can purchase them				
Smolczynski	17-Dec-11	bison patrol	yellowstone village and butte	collect bison info				routine patrol

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Smolczynski	18-Dec-11	bison patrol	madison river	collect bison info and check hunter				routine patrol
Sheppard	19-Dec-11	Mauray Miller	23 Maiden Basin Drive	needs 20 more panels			1	will call her back provided her with information as to where to purchase.
Sheppard	19-Dec-11	Germaine White	Pablo CSKT	weekly update check in for tribal hunt. 17 bison in Horse Butte HOA, two reported but not seen in Eagle Ck.				weekly update check in for tribal hunt. 17 bison in Horse Butte HOA, two reported but not seen in Eagle Ck.
Sheppard	19-Dec-11	Hazing meeting	DOL, YNP	Hazing ops meeting	1	1	1	
Smolczynski	19-Dec-11	germain white	wyell	call about bison movements				discussion of landscape
Sheppard	20-Dec-11	Hazing meeting	DOL, YNP	Hazing ops meeting				put together notes for Pat, Christian, Marty, YNP Review
Sheppard	20-Dec-11	Mauray Miller	23 Maiden Basin Drive	needs 20 more panels		1		Called her back, 20 panels approved will work on delivery
Sheppard	20-Dec-11	Jim Marsh	Confederated Tribes of Umatilla	bison update request				called him back, left message describing snowpack and numbers in the Gardiner and Wy area
Smolczynski	21-Dec-11	bison patrol	wyell	check madison river				no bison found
Smolczynski	23-Dec-11	bison patrol	wyell	bison hunter in closed area				reported to fs and tickets issued to tribal members. 3 bison taken
Smolczynski	24-Dec-11	bison hunter	wyell	calling about bison movement				discussion of bison out
Smolczynski	27-Dec-11	bison hunter	wyell	email from sheppard about bison hunter				None sheppard handling on his end
Knarr	28-Dec-11	SMOLZ	WEST YELLOWSTONE	CALL FOR UPDATE		1		CALL 32 FOR UPDATE
Sheppard	28-Dec-11	Stephanie Sea BFC	BFC West Yellowstone	inquired about what information FWP was putting out regarding BFC in relation to hunt. "protest" promotes confrontation and bad image				I committed to review DVD, send email confirming our position and BFC's role and track record, review documents, send her our maps
Sheppard	28-Dec-11	Lewis Caye CSKT hunter	Pablo CSKT 13 members 5 permits	wanted to know where to hunt in WY. Gave him general information and sent him to the USFS for more info.				called Smolz. Told him to keep an eye out for them and help them if he can. Will also talk with Germaine about this group
Sheppard	28-Dec-11	Jeff Cronce	Nez Perce Tribe GIS	Wanted information on Eagle Closure at horse butte				Sent him to USFS, we don't have that exact mapping information. Gave him Cavin's number
Sheppard	29-Dec-11	Germaine White	CSKT	bison update request				gave update, talked about tribal expectations orientation and bison movements.

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Sheppard	29-Dec-11	Winston Greely	FWP video unit	discuss updating and modification of bison hunt dvd.				
Sheppard	29-Dec-11	Brent Webber	Gov. tag holder from Helena	concerns relating to BFC he experienced during his hunt in West Yellowstone	1			Talked with him about his experience, let him know that Smolz would be calling him, and that we would address his concerns with the BFC
Smolczynski	29-Dec-11	bison patrol	madison river and horse butte	collect bison info				routine patrol
Smolczynski	29-Dec-11	state of montana	dot shop in wyell	discuss potential road hazards				information as needed basis
Smolczynski	30-Dec-11	bison hunter	wyell	discuss bison availability				unsure of huntable bison
Smolczynski	31-Dec-11	bison patrol	madison river and cougar creek	bison patrol				routine patrol
Sheppard	1-Jan-12	Germaine White	Pablo	Bison update				called back gave update report
Sheppard	1-Jan-12	Alan Shaw RTR	RTR Gardiner	RTR Fence down near south end			1	check with Pat about fence fix contractor. Sent Christian M. an e-mail along with Alan Shaw
Miller	2-Jan-12	Cooke City	Cooke City	patrol and observe bison				none outside YNP, several hundred by blacktail deer creek
Miller	2-Jan-12	DOL	Livingston, MT	met with Jeff Mount				discussed buffalo movements within YNP
Knarr	5-Jan-12	MILLER, J		CALL TO CHECK ON BISON activity	1	1	1	left message
Smolczynski	6-Jan-12	bison patrol	wyell	check hunters				routine patrol
Knarr	7-Jan-12	MILLER, J		CALL TO CHECK ON BISON activity	1	1	1	call back nothing new
Smolczynski	8-Jan-12	bison patrol	horse butte and madison river	collect bison numbers and move				routine patrol
Smolczynski	10-Jan-12	susan mcclure	wyell	complaint about bison hunt				discussion of rules
Sheppard	11-Jan-12	Scott Hamilton	Gardiner	wants compensation for the 1400.00 spent on fence damaged by bison last winter			1	Discussed with him the NGO effort asked for documentation, offered to pose the question to NGO's
Sheppard	11-Jan-12	Germaine White	Pablo	bison update				discussed BFC presence and issues associated with cultural hunt
Sheppard	11-Jan-12	Adam Vilivencio	Nez Perce tribe	3 permits issued and two wardens coming to Gardiner this weekend				
Smolczynski	11-Jan-	bisonreport /patrol	wyell	collect bison info				routine patrol

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					26	172	63	
	12							
Knarr	12-Jan-12			CALL REGARDING BISON HUNT THIS WEEKEND BY NEZ PERCE		1		CASS
Smolczynski	12-Jan-12	bison patrol	madison river	collect bison info and check hunter				routine patrol
Knarr	13-Jan-12	SMOLZ		CALL REGARDING BISON NOTHING OUT		1		CALL
Smolczynski	13-Jan-12	Forest service	wyell	meet with fs biologist				discussion of landscape
Miller	14-Jan-12	Cooke City	Cooke City	patrol and observe bison				none outside YNP
Smolczynski	14-Jan-12	bison patrol	wyell	check madison river				no bison found
Knarr	15-Jan-12					1		Patrol West Yellowstone area. Contact 4 CSKT hunters, check permits and ID
Knarr	17-Jan-12	SMOLZ		CALL TO CHECK ON BISON NUMBERS 0		1		NO BISON
Miller	17-Jan-12	Gene Carter	Pine Creek, MT	RTR fencing			1	coordinating with P. Flowers to maintain fence
Miller	19-Jan-12	Gene Carter	Pine Creek, MT	RTR fencing			1	will start maintenance on 1-24
Knarr	21-Jan-12			BISON HUNTERS AND BISON OUT OF THE PARK			1	NO BISON OUT, TALKED TO ONE STATE BISON HUNTER
Smolczynski	21-Jan-12	bison patrol	wyell	check madison river				talk with state hunters
Knarr	23-Jan-12			BISON MOVEMENT		1		CALL TO DOL MOUNT. CALL CHAIN DISCUSSED, 50 BISON JUST INSIDE PARK
Knarr	23-Jan-12			BISON MOVEMENT		1		TEXT FROM HELMS THAT 50 BISON ARE MOVING NORTH
Knarr	23-Jan-12					1		MEET WITH ANDREA AND SAM ABOUT BISON
Sheppard	23-Jan-12	Germaine White	Pablo	Weekly update				discussed bison issue
Sheppard	23-Jan-12	James Curry	CTU	update on bison movements				sent back an e-mail outlining lack of bison movement sent out clarifying e-mail to shoshone bannock, CSKT, NP, CTU
Sheppard	23-Jan-12	CTU,						
Miller	24-Jan-12	Gene Carter	Pine Creek, MT	RTR fence maintenance			1	talked about RTR fence
Miller	24-Jan-	Joe Knarr	Bozeman, MT	left message to call me				left a message

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	12							
Miller	24-Jan-12	Tony Novak	Helena, MT	talked about proper way to maintain RTR fence			1	assisted Gene Clark with fence maintenance
Miller	24-Jan-12	Sam Sheppard	Bozeman, MT	asked how to fund materials for fence maintenance			1	said he would get answers and call me back
Miller	24-Jan-12	Sam Sheppard	Bozeman, MT	told me to tell Gene to figure out costs with DOL			1	told Gene to call DOL
Miller	24-Jan-12	Joe Knarr	Bozeman, mT	left message to call me				left a message
Miller	24-Jan-12	Joe Knarr	Bozeman, MT	did not answer cell phone				did not leave a message
Miller	24-Jan-12	Joe Knarr	Bozeman, MT	missed call				missed call
Miller	24-Jan-12	Joe Knarr	Bozeman, MT	left message as I missed call				left a message
Miller	24-Jan-12	Gene Carter	Bozeman, MT	informed me he was about done for the day, and will contact DOL for future questions and calls			1	thanked him for working, and said I will talk to him later
Miller	24-Jan-12			Went to Gardiner, checked for Bison in Eagle creek, Hays Place, Little Trail Creek, and Beattie Gulch, did not see any bison, personal horse and trailer use				
Sheppard	24-Jan-12	Dale Ratliff	265-1694 Little Shell Tribe	Tribal hunt questions				Clarified hunt period and area, provided hotel information, clarified wolf season closed in the area.
Smolczynski	24-Jan-12	tribal warden	wyell	calling about bison movement				discussion of bison out
Miller	25-Jan-12	Andrea Jones	Bozeman, MT	returned call and left message stating that I did not know of any bison taken in the 2nd state hunt				
Miller	25-Jan-12		livingston, mt	took work vehicle into shop to have new battery and check engine light fixed				
Sheppard	27-Jan-12	Danny Stubendeck	507 S Walnut Helena	bison hunting brucellosis questions also concerned about BFC hazing bison inside the arch last week in Gardiner				answered questions about meat handling and took information about BFC and will pass on to YNP
Knarr	28-Jan-12	MILLER, J		BISON MOVEMENT		1		NO BISON ON LANDSCAPE
Miller	28-Jan-12	Joe Knarr	Bozeman, MT					discussed bison situation and involving wildlife bureau
Miller	28-Jan-12	Dave Risley	Helena, MT	sent email about getting into field				invited him to come and see bison situation first hand

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Miller	28-Jan-12	Joe Knarr	Bozeman, MT	sent email about wildlife bureau				discussed bison situation and involving wildlife bureau
Smolczynski	28-Jan-12	dol	wyell	visit about any bison movements				no bison found
Smolczynski	28-Jan-12	bison patrol	wyell	check bison movement				no bison found
Knarr	29-Jan-12	Smolz		CHECK IN		1		NO BISON ON LANDSCAPE. NEZ PERCE AND SALIS HUNTERS IN THE AREA.
Knarr	30-Jan-12	Smolz		BISON MOVEMENT		1		CONFIRM HE HAS SEEN NO BISON OUT
Knarr	30-Jan-12	Smolz				1		CONFIRMED WITH BRIDGER HE HAS NOT SEEN ANY BISON JUST TRACKS
Sheppard	30-Jan-12	Germiane White	Pablo	Bison hunting update, CSKT end of hunt wrap up. Approximately six taken. Will let us know if hunt will be extended. Joe Durgalo is new chairman of CSKT				
Sheppard	31-Jan-12	Jason Fluery	77017 Gallatin Rd	General questions on if bison are out of YNP currently in Gardiner				gave him the hot line phone number, let him know that currently there appear to be no bison on landscape, and informed him of our statutory limitations on bison information.
Miller	1-Feb-12	Joe Knarr	Bozeman, mt	weekly bison reports				received email ordering me to make weekly bison reports a priority
Miller	2-Feb-12	Sam Sheppard	Bozeman, mt	no visual barrier on RTR fence			1	sent email stating, I will put up barrier if given project # and help from the wildlife bureau
Miller	2-Feb-12	Pat Flowers, joe knarr	Bozeman, mt	no visual barrier on RTR fence			1	cc'd above email
Miller	2-Feb-12	Joe Knarr	Bozeman, mt	reminding me that Bison report is due on Monday Morning				read email and will continue to give report
Miller	2-Feb-12	Jim Smolz	West Yellowstone, MT	west yellowstone bison report				read email
Miller	2-Feb-12	Sam Sheppard	Bozeman, mt	field operations email		1		read email
Miller	2-Feb-12	Joe Knarr	Bozeman, mt	send buffalo log from January				sent email
Miller	2-Feb-12	Cooke City	Cooke City	patrol and observe bison				none outside YNP, several hundred by blacktail deer creek
Miller	2-Feb-12	DOL	Livingston, MT	met with Jeff Mount				discussed buffalo movements within YNP
Scott	2-Feb-12	Cooke City	Cooke City	patrol and observe bison				none outside YNP, several hundred by blacktail deer creek
Scott	2-Feb-	DOL	Livingston, MT	met with Jeff Mount				discussed buffalo movements within YNP

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	12							
Smolczynski	3-Feb-12	bison patrol	wyell	patrol madison river, horse butte				routine patrol
Knarr	6-Feb-12	SMOLZ		CHECK ON BISON ACTIVITY				DID NOT SEE OR HEAR OF ANY BISON OVER THE WEEKEND
Knarr	6-Feb-12	MILLER		CHECK ON BISON ACTIVITY				WAS OFF THIS WEEKEND IS HEADED TO GARDINER TO CHECK FOR BISON
Miller	6-Feb-12	Sam Sheppard	Bozeman, mt	any bison out of park				sent email saying I did not know of any bison outside YNP
Miller	6-Feb-12	andrea jones	Bozeman, mt	any bison out of park				sent email saying I did not know of any bison outside YNP
Miller	6-Feb-12	sam sheppard	Bozeman, mt	any bison out of park				left voice message saying I did not know of any bison outside YNP
Miller	6-Feb-12	andrea jones	Bozeman, mt	any bison out of park				left voice message saying I did not know of any bison outside YNP
Miller	6-Feb-12	Joe Knarr	Bozeman, mt	any bison out of park				asked me to go to Gardiner and verify if any bison outside YNP
Miller	6-Feb-12	Gardiner	gardiner	check for bison				no bison located outside YNP, corwin to OYTS, Jardine, eagle creek, Lil Trail creek, hwy to YJ canyon
Miller	7-Feb-12	Joe Knarr, sam sheppard, pat flowers, karen loveless, howard burt, jim smolz, julie cunningham	region 3	bison report				asked for assistance if they hear of any bison outside of YNP gave the report of no bison outside of YNP
Miller	7-Feb-12	joe knarr	Bozeman, mt	bison activities				discussed my procedure for bison problems during my annual performance appraisal
Knarr	8-Feb-12	MILLER		BISON ACTIVITY				MET AT R3 DISCUSSED BISON STATUS AND CURRENT ON THE GROUND SITUATIONS
Knarr	8-Feb-12	SMOLZ		CHECK ON BISON ACTIVITY				NONE
Smolczynski	8-Feb-12	bison patrol	wyell	patrol madison river, horse butte				routine patrol
Knarr	9-Feb-12	SMOLZ		GUT PILE OFF RAINBOW PT. ROAD. COMPLAINT BY NEARBY RESIDENT. DAVID KEITH				SMOLZ VISITED WITH RESIDENT AND DISCUSSED SITUATION. UNABLE TO MOVE GUT PILE FROM LOCATION
Knarr	9-Feb-12	SMOLZ		BISON ACTIVITY				MEET WITH SMOLZ AT R3 DISCUSS BISON GUT PILE AND OTHER POSS. ISSUES
Smolczynski	9-Feb-	david keith	wyell	complaint about bison hunter, gut pile on driveway				discussion of rules

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	12							
Knarr	10-Feb-12	J.MOUNT		UNKNOWN				CALLED BACK LEFT MESSAGE
Miller	10-Feb-12	Cooke City	Gardiner, cooke city	patrol and observe bison				checked for Aborigines hunting bison, did not locate any in the gardiner basin
Smolczynski	10-Feb-12	forestservic e	wyell	reply on complaint, fs ground, fs put up camera on gut pile				routine patrol
Knarr	11-Feb-12	MILLER		CHECK ON BISON ACTIVITY				
Knarr	11-Feb-12	SMOLZ		CHECK ON BISON ACTIVITY				
Smolczynski	11-Feb-12	bison patrol	madison river	collect bison info and check hunter				routine patrol
Smolczynski	13-Feb-12	forestservic e	wyell	meet with fs biologist				discussion of landscape
Scott	14-Feb-12	Cooke City	Cooke City	patrol and observe bison				none outside YNP
Knarr	15-Feb-12	MILLER		MAKE SURE WE CHECK ON ABORIGINAL HUNTERS OVER WEEKEND				JIM SAID HE WILL CHECK ON SAT. AND MONDAY
Miller	17-Feb-12	gardiner	gardiner	bison hunters				checked for Aborigines hunting bison, did not locate any in the gardiner basin
Miller	17-Feb-12	Joe Knarr	Bozeman, mt	Aboriginal hunt				Sgt knarr stated that Nez Perce spread rumors to director of FWP that they were going to start shooting elk, they were mad that there were no bison out of the park. Sgt Knarr asked that I document any elk kills and call him for direction as to any further actions.
Miller	18-Feb-12	Cooke City	Cooke City	patrol and observe bison				observed bison inside YNP
Scott	18-Feb-12	Cooke City	Cooke City	patrol and observe bison				none outside YNP
Sheppard	18-Feb-12	Knarr FWP		Oatman group hunting without tribal permits on "ritual hunt"				
Knarr	19-Feb-12	KNARR		CHECK ON BISON ACTIVITY CALL FROM MILLER ABOUT COW KILLED				CONTACTED NEZ PERCE WITH COW ELK. BEGIN INVEST
Knarr	19-Feb-12	MILLER						CALLS REGARDING CASE
Knarr	19-Feb-12	BRIAN HELMS						CALL REGARDING CASE
Knarr	19-Feb-12	LEE WHITEPLU ME						CALL REGARDING CASE

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Knarr	19-Feb-12	SHEPPARD						CALL REGARDING CASE
Sheppard	19-Feb-12	Knarr FWP		Update on Oatman group and case reports				
Knarr	20-Feb-12	MILLER						CALLS REGARDING CASE
Sheppard	20-Feb-12	Adam Villavicencio	NP Tribe,	Discussed prosecution of Oatman group, evidence and case reporting				
Knarr	21-Feb-12	MILLER						CALLS REGARDING CASE
Smolczynski	21-Feb-12	bison patrol	wyell	check madison river				routine patrol, no bison
Knarr	22-Feb-12	BRIAN HELMS		11 BISON NORTH OF STEHPENS CRK. 19 AT SCHOOL		1		INFO. NOTED PASSED TO 31 ANDJONES
Miller	22-Feb-12	Scott Hamilton	Gardiner, MT	Bison outside Park				Scott just called to inform me there were bison outside the park - 9 in stephens creek area and a larger group on the football field
Miller	22-Feb-12	Joe Knarr	Bozeman, mt	bison outside park				passed on information from Hamilton
Miller	22-Feb-12	Julie at Gardiner School	Gardiner, MT	bison at school				she called just to inform me that around 10 bison were on the football field
Knarr	23-Feb-12	MILLER		MESSG. ABOUT ABOVE BISON		1		
Knarr	23-Feb-12	BRIAN HELMS		TXT. BISON HAVE MOVED BACK INTO PARK FARTHER		1		
Miller	23-Feb-12	Jeff Mount	Livingston, MT	bison out, please call				11 head of bison near reese creek
Miller	23-Feb-12	Jeff Mount	Livingston, MT	buffalo are out				11 head of bison were out and Wally hazed them back to YNP
Scott	23-Feb-12	Livingston, MT	414 East Callender Street Livingston, MT	Training Attended with Jeff Mount				Discussed buffalo movements within YNP
Sheppard	24-Feb-12	IBMP meeting						
Sheppard	24-Feb-12	Mike Lopez, McCoy Oatman,	NP Tribe,	Discussed previous weeks illegal take, elk, prosecution, updates on harvest for coming weekend				
Sheppard	25-Feb-12	Jen Williams	FWP	NP Tribal hunter update from Gardiner 3 bull elk taken				

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Sheppard	26-Feb-12	NP Enforcement	Lapwai ID	local resident in grey pickup blocked road of NP hunters to take photographs of bull elk taken by the tribe		1		took down license plate and instructed NP Enf. To contact local sheriff if situation got worse
Sheppard	27-Feb-12	Chelsea DeWeese	Gardiner, Jardine Road 531-6930	NP Tribal hunters taking bull elk up jardine road.		1		called her back explained situation, harvest and coverage by enforcement
Sheppard	27-Feb-12	Bill Hoppe	Gardiner, Jardine Road	NP Tribal hunters taking bull elk up jardine road. Did not block the road. Drinking beer while hunting and yelling at the locals, poor representation of the tribe.		1		discussed current situation and permitting requirements. Discussed social situation and perception of the hunt. Advised him not to get into a conflict
Knarr	28-Feb-12	SMOLZ				1		VISITED WITH SMOLZ ABOUT BISON CASE GOING TO TRIAL TOMORROW
Knarr	28-Feb-12	MILLER				1		EMAILED MILLER ABOUT PATROLS ON UP COMING WEEKENDS. MILLER ACKN. HE GOT MEMO
Knarr	28-Feb-12	MOREY		TXT 3 BULL HEADED NORTH. RETURNED TO PARK .		1		NOTIFIED 31
Knarr	28-Feb-12	MOREY		TXT 34 BISON MOVING NORTH OF STEPHENS CRK ROAD		1		NOTIFIED 31
Knarr	28-Feb-12	CSKT WARDENS 3				1		VISITED WITH THEM ABOUT CASE GOING TO TRIAL ON 29TH.
Smolczynski	28-Feb-12	fwp	bozeman	review bison case for district court				discussion for case
Knarr	29-Feb-12	SHEPPARD				1		VISITED WITH 31 REGARDING IMPLICATIONS OF PLAN BEING APPROVED ON 28TH.
Knarr	29-Feb-12	MILLER				1		VISIT ABOUT ABORIGINAL HUNTS AND DEPT. DIRECTION
Miller	29-Feb-12	Jeff Mount	Livingston, MT	buffalo status				discussed recent decision to allow bison to roam in the Gardiner basin
Smolczynski	29-Feb-12	fwp	bozeman	attend trial				guilty verdict
Miller	1-Mar-12							monitor aboriginal hunt
Sheppard	1-Mar-12	Bison Trial Park Co		Trial				attend trial provide information
Sheppard	1-Mar-12	Sabina Strauss	Gardiner	none happy with fencing				thank you
Smolczynski	1-Mar-12	bison patrol	wyell	patrol madison river, horse butte				routine patrol
Knarr	2-Mar-12	MILLER		BISON ACTIVITY				25-50 BISON ON RTR BROKE THROUGH FENCE ON RTR, 12 OR SO MORE HEADED NORTH TOWARD RTR. ELK ONLY ON JARDINE SIDE.

Table B1.—Log of incidents responded to by MFWP Wardens from Nov 2011 through Aug 2012.

Officer	Date	Landowner or Contact	Address	Concern	Public Safety (PS), Hazing (H), Property Damage (PD)			Action Taken
					PS 26	H 172	PD 63	
Knarr	2-Mar-12	MILLER		BISON HUNT				TXT 2 BISON KILLED AT EDGE OF PARK AND REST MOVED INTO PARK
Knarr	2-Mar-12	HELMS		BISON HUNT				CALL TO CONFIRM BISON SHOT NEAR PARK
Miller	2-Mar-12							monitor aboriginal hunt
Knarr	3-Mar-12	MILLER		ABORIGINAL HUNT				TXT NO BISON LOOKIN FOR ELK
Miller	3-Mar-12							monitor aboriginal hunt
Sheppard	3-Mar-12	Joe Knarr	FWP	NP tribal hunt update				two bulls taken Beatie
Smolczynski	3-Mar-12	bison call	wyell	CSKT, overview of case and bison discussion				NA
Knarr	4-Mar-12	MILLER		ABORIGINAL HUNT				TXT 4 BISON DOWN AT DRY LAKE BED
Knarr	4-Mar-12	MILLER		ABORIGINAL HUNT				TXT/MESSG. 7 TOTAL BISON TAKEN HUNTERS HEADED BACK TO IDAHO
Knarr	4-Mar-12	SHEPPARD		ABORIGINAL HUNT				MESSGS. REGARDING WKEND ACTIVITIES
Knarr	4-Mar-12	SHEPPARD		ABORIGINAL HUNT				UPDATE ON WKEND ACTIVITIES
Miller	4-Mar-12							monitor aboriginal hunt
Scott	4-Mar-12	Gardiner	Gardiner	Patrol Bison hunt (tribe)				none-2 bison outside park/tribe shot one
Knarr	5-Mar-12	MILLER/GL ENN HOWIE LEASEE	CHURCH PROPERTY / HORSE LEASE CORWAN BRIDGE	BULL BISON W/HORSES				GETTING READY TO HEAD SCENE/ MOUNT ON HIS WAY/HELMS CALLED MOUNT
Knarr	5-Mar-12	MILLER/GL ENN HOWIE LEASEE	CHURCH PROPERTY / HORSE LEASE/CO RWAN BRIDGE	BULL BISON W/HORSES		1		LEASEE MOVED BULL OUT OF HORSE PASTURE
Miller	5-Mar-12							monitor aboriginal hunt
Sheppard	5-Mar-12	Joe Knarr	FWP	NP tribal hunt update				7 total bulls taken for weekend
Sheppard	5-Mar-12	Joe Knarr/Jim Miller	FWP	1 bull in horses at Corwin on RTR		1	1	Lessee hazed bull out of horses. Miller and Jeff Mount responded. Miller continuing to monitor the situation

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					26	172	63	
Sheppard	5-Mar-12	Joe Knarr/Jim Miller	FWP	11 cows and calves moving from beatie toward RTR Coke ovens area			1	Miller attempting to locate and monitoring
Sheppard	5-Mar-12	Maurey Miller	Gardiner	panels			1	cut 20 more hog wire fence to be delivered this week for property damage protection
Sheppard	5-Mar-12	RTR	Gardiner	bison challenging fencing			1	bought additional visual barrier tape and staples to enhance RTR fencing to be installed this week
Sheppard	5-Mar-12	Aboriginal Tribal hunt update		weekly update				sent weekly update
Sheppard	5-Mar-12	Jim Smolz	FWP	14 bison along Madison River in huntable FS area				sent weekly update
Sheppard	5-Mar-12	Matt Skoglund	NRDC	e-mail requesting bison fencing panel system for school bus stops in Gardiner Basin	1			sent e-mail
Sheppard	5-Mar-12	Alan Shaw	RTR	Ranch Office fencing, next to Beatie, Gene Carter, Miller, gates need to be powder river panel gates.	1		1	will send e-mail to Christian requesting powder river gate replacement
Sheppard	5-Mar-12	Christian Mackay	DOL	Powder River gate e-mail on RTR referenced above		1	1	sent e-mail
Smolczynski	5-Mar-12	Forest service	wyell	Bison conference call				update on program
Smolczynski	5-Mar-12	fwp	wyell	routine patrol				routine patrol
Sheppard	7-Mar-12	Nancy Gruehl	223-3819 or 848-2434, 1075 Hwy 89 S. Gardiner	request payment for fencing. Canvassing continuation?	1		1	called her back and discussed it with her, waiting on her written request for reimbursement.
Knarr	8-Mar-12	MILLER		11 + 28 BISON NORTH OF PARK LINE NEAR BETTIE, 70 MOVING NORTH TOWARD PARK LINE		1		CALLED 31 WITH UPDATE.
Sheppard	9-Mar-12	Maurey Miller	Little Trail Rd Hwy 89	Tree Damage			1	Delivered 20 panels for trees
Sheppard	9-Mar-12	Nancy Gruehl	1075 HWY 89 Gardiner	Fence Reimbursement			1	Stopped at house no one home took photos of fence she built.
Sheppard	9-Mar-12	NP Tribe	Idaho					monitored hunt
Sheppard	9-Mar-12	Howy ?	Corwin Springs bridge on RTR	4 horses that bull bison was in last week			1	reviewed fencing visual barrier tape is not practical
Sheppard	10-Mar-12	Jim Miller	FWP	hunt update/ group of bison crossed river into Hoppe's cows came from west side at Beatie			1	DOL contacted Miller able to assist. Hazed out
Scott	11-Mar-	Gardiner	Gardiner	Patrol Bison hunt (tribe)				No bison outside the park (no tribes on the landscape)

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					26	172	63	
	12							
Sheppard	11-Mar-12	Drew Scott	FWP	Bison hunt/Gardiner area update				no issues, no bison located on the landscape NP tribe took app. 4 bison two bulls E. and 2 cows W.
Smolczynski	12-Mar-12	bison patrol	madison river	patrol madison river, horse butte				routine patrol
Smolczynski	14-Mar-12	dol	wyell	call bridger with some bison #'s				NA
Sheppard	16-Mar-12	Mike Marsh	Umatilla	bison update for the hunt				will send report later next week
Sheppard	16-Mar-12	Matt Skoglund	NRDC	willing to buy 5 school bus exclosures.				will attempt to buy them today
Smolczynski	17-Mar-12	fwp	wyell	patrol madison river, horse butte				routine patrol
Knarr	19-Mar-12	MILLER		REVIEW BISON STATUS, FENCING ISSUES	1	1	1	
Knarr	19-Mar-12	SMOLZ		BISON UPDATE, 70 CONFIRMED OUT ON HORSE BUTTE		1		
Sheppard	19-Mar-12	Nancy Gruehl	Gardiner	received her request for payment				will pass it on to NGOS
Sheppard	19-Mar-12	Jim Miller	FWP	bison update, fencing update, asked him to check with gardiner school district on bus stops				miller is headed down this afternoon
Knarr	24-Mar-12	KNARR		TRAVEL TO W. YELLOWSTONE TO CHECK ON BISON STATUS.		1		NO BISON OR HUNTERS OBSERVED.
Knarr	25-Mar-12	KNARR		TRAVEL TO GARDINER TO CHECK ON BISON STATUS, AND RTR FENCE		1		NO BISON OR HUNTERS OBSERVED. MOST/ALL BISON BACK IN BLACKTAIL OF PARK, FENCE NEAR RTR HEADQTR. IS GOOD SHAPE NEW GATE IN PLACE.
Miller	26-Mar-12							monitor aboriginal hunt
Miller	27-Mar-12							monitor aboriginal hunt
Miller	28-Mar-12							monitor aboriginal hunt
Knarr	29-Mar-12	MILLER		DISCUSS BISON ISSUES AND STATUS IN GARDINER AREA.		1		
Miller	29-Mar-12							monitor aboriginal hunt
Miller	31-Mar-12							monitor aboriginal hunt
Knarr	2-Apr-12	MILLER		DISCUSS BISON ISSUES AND STATUS IN GARDINER	1	1		

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Public Safety (PS), Hazing (H), Property Damage (PD)								
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					26	172	63	
Knarr	2-Apr-12	SMOLZ		TALK TO SMOLZ PHONE, 400 BISON ON BUTTE AND IN VILLAGE. SMOLZ WILL CHECK		1		WILL GO TO VILLAGE ON BUTTE AND CHECK
Knarr	2-Apr-12	SMOLZ		130 OR SO BISON IN VILLAGE, NO PROPERTY OR SAFETY COMPLAINTS AS OF YET. SOME CONCERN FROM DOG WALKERS.		1		
Smolczynski	2-Apr-12	stovall	valantine lane, Horse Butte	safety, many buffalo in subdivision	1			visit with several homeowners
Knarr	4-Apr-12	SMOLZ		CALL TO SMOLZ, NO NEW UPDATES ON BISON OUT.		1		
Knarr	9-Apr-12	MILLER		3 BISON ABOVE F. RIGGLERS, FRANKLIN SPOKE TO DOL CONCERNED ABOUT TREES. 8 BISON ON RTR HAYFIELD		1		
Knarr	10-Apr-12	S. HAMILTON	PAT HOPPE	8 BISON CROSSED RIVER, BLEW HORSES THREW FENCE, NOW ALONG HWY AT PATS		1		MESSG TO MILLER, DREW TALK TO FLOWERS, JONES
Knarr	10-Apr-12	BILL HOPPE	PAT H	TALK TO BILL REGARDING BISON,		1		ENROUTE GARDINER
Knarr	10-Apr-12	MOUNT	PAT HOPPE	TALK TO MOUNT ABOUT BISON ALONG HWY		1		ENROUTE GARDINER
Knarr	10-Apr-12	SCOTT	PAT HOPPE	DIRECT SCOTT TO MEET ME AT HOPPE				
Knarr	10-Apr-12	PAT HOPPE	DRIVEWAY	BISON ALONG HWY AND WILL ENTER PAT HOPPE, PAT DOES NOT WANT BISON HAZED ACROSS HIS LAND		1		MOUNT, SCOTT, B.HOPPE AND KNARR HAZE 8 BISON UP LITTLE TRAIL CREEK TO TOP OF RIDGE. MILLER WALKED BISON TO TRAVERTINE RD.
Knarr	10-Apr-12	KELLY AT STURMITZ		BISON CROSSING		1		KELLY SAID OK TO HAZE ACROSS STURMITZ PROPERTY
Knarr	10-Apr-12	FLOWERS/JONES				1		UPDATE ON ACTIONS
Knarr	10-Apr-12	SMOLZ		39 BISON NEAR DENNY CREEK, MOVED TO POVAH'S		1		BISON MOVED TO POVAHS
Knarr	11-Apr-12	SMOLZ		39 BISON ON POVAHS		1		MOUNT AND BRIDGER HAZING TO BUTTE, F.S. WILL NOT ALLOW SMOLZ TO USE ATV, SMOLZ WILL ASSIST WITH VEHICLES
Knarr	11-Apr-12	MILLER		4 BISON IN EAGLE CRK LIKELY FROM YESTERDAYS BULLS		1		
Knarr	11-Apr-12	KNARR				1		HORSED AND ATV TO WEST YELLOWSTONE FOR SMOLZ
Miller	11-Apr-12	Pat Hoppe	Gardiner, MT	property damage		1		haze 6 bulls to Little Trail Cr
Smolczynski	11-	povah	denny crk	haze bison from south fork		1		Haze buffalo across south fork

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Officer	Date	Landowner or Contact	Address	Concern	Public Safety (PS), Hazing (H), Property Damage (PD)			Action Taken
					PS	H	PD	
					26	172	63	
ki	Apr-12		road					
Smolczynski	12-Apr-12	swanson	mcallister	pick up hay for horses				buy 2 ton hay for state horses
Smolczynski	13-Apr-12	state of montana	hwy287	haze bison from campground		1		Haze buffalo to Forest service
Smolczynski	15-Apr-12	povah	denny crk road	haze bison from south fork		1		Haze buffalo to Forest service
Knarr	16-Apr-12	SMOLZ		BISON ACTIVITY		1		SMOLZ IS ASST. D.O.L WITH THE HAZING OF BISON FROM POVAH'S BACK TO THE AREA OF HORSE BUTTE.
Knarr	16-Apr-12	SMOLZ		BISON ACTIVITY		1		60 BISON ACROSS RIVER, 30 LEFT NEAR DENNY CRK. HAZE TOMORROW. CALLED LATER WHILE HAZING
Knarr	16-Apr-12	MILLER		BISON ACTIVITY		1		NO BISON CALLS OR COMPLAINTS
Knarr	16-Apr-12	MILLER		HELP WITH 4/17 HAZE		1		MILLER CALLED BACK AND WILL COORD. WITH SMOLZ TO ASSIST W/4-17 HAZE
Smolczynski	16-Apr-12	povah	denny crk road	haze bison from south fork		1		Haze buffalo to Forest service
Knarr	17-Apr-12	MILLER	PETER DR. GARDINER	BISON ON PROPERTY			1	CALL FROM MILLER THAT HE WAS CALLED BY S. HAMILTON. COMPLAINED BISON IN HIS YARD. TOLD MILLER TO CALL HAMILTON AND STOP BY ON HIS WAY BACK FROM WEST YELLOWSTON.
Knarr	17-Apr-12	SCOTT HAMILTON	PETER DR. GARDINER	BISON ON PROPERTY			1	CALLED HAMILTON AND HE SAID HE HAS 7 BISON ON HIS PROPERTY AND IS WORRIED ABOUT DAMAGE TO FENCE. WILL NOT MOVE THEM AN INCURE THE LIABILITY OF DOING G THIS. SENT 3 PHOTO'S OF BISON
Knarr	17-Apr-12	SHEPPARD		BISON ON PROPERTY				CALL TO SHEPPARD UDATING ON HAMILTONS CALL AND SENT PHOTO'S.
Knarr	17-Apr-12	MILLER	PETER DR. GARDINER	BISON ON PROPERTY		1		CALL FROM MILLER. BISON MOVED OFF HAMILTONS PROPERTY BY MILLER.
Knarr	17-Apr-12	MILLER	POVAH'S WEST YELLOWS TONE	90 BISON ON POVAHS				CALL FROM MILLER THAT 90 BISON HAVE NOW MOVED TO POVAH'S IN WEST. BRIDGER ASKING FOR HELP TOMORROW. DIRECTED MILLER TO BE IN GARDINER FIRST THING IN THE MORNING TO MONITOR THAT SITUATION.
Knarr	17-Apr-12	BRIDGER	POVAH'S WEST YELLOWS TONE	90 BISON ON POVAHS				CALL TO BRIDGER, DISCUSS BISON ON POVAH'S, TELL HIM WE WILL HAVE SMOLZ ON ATV (HORSE SORED UP) AND POSSIBLY ONE OTHER ATV IN THE MORNING.
Knarr	17-Apr-12	SMOLZ	POVAH'S WEST YELLOWS TONE					CALL TO SMOLZ ARRANGE ATV HELP IN MORNING
Knarr	17-Apr-12	LLOYD	POVAH'S WEST YELLOWS TONE					CALL AND ARRANGE LLOYD TO HELP IN WEST WITH ATV IN THE MORNING.
Knarr	17-Apr-	SHEPPARD	POVAH'S WEST					CALL SHEPPARD WITH FINAL UPDATE

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Officer	Date	Landowner or Contact	Address	Concern	Public Safety (PS), Hazing (H), Property Damage (PD)			Action Taken
					PS	H	PD	
					26	172	63	
	12		YELLOWSTONE					
Smolczynski	17-Apr-12	povah	denny crk road	haze bison from south fork		1		Haze buffalo to Forest service
Knarr	18-Apr-12	KNARR	GARDINER AREA	BISON AND PROPERTY			1	PATROL GARDINER AREA WITH 313 FOR BISON. 11 BISON UP JARDINE ROAD ON Z HILL. NOW BISON IN TOWN. CHECK HAMILTON FOR BISON NO BISON. NO NOTICABLE DAMAGE TO PROPERTY.
Knarr	18-Apr-12	KNARR	WEST YELLOWSTONE	BISON ON POVAHS		1		CHECK IN W TIERNY AND HOW OPERATION WAS GOING. 37 AND 32 ASSISTING. BISON NEAR CAMPGROUND.
Knarr	18-Apr-12	SHEPPARD	WEST YELLOWSTONE	BISON ON POVAHS		1		UPDATE TO 31.
Smolczynski	18-Apr-12	state of montana	Hwy 287	haze from yellowstone holiday		1		Haze buffalo to Forest service
Knarr	19-Apr-12	SMOLZ	WEST YELLOWSTONE					CALLED FROM 38 TO GET UPDATE. SAME AS ABOVE
Smolczynski	19-Apr-12	povah	denny crk road	haze from south fork		1		Haze buffalo to Forest service
Knarr	20-Apr-12	BRIDGER	WEST YELLOWSTONE	BISON ON POVAHS		1		BRIDGER CALLED SAID 30 BISON ON POVAH'S LOOKING FOR HELP. OFFERED 38 AND 312 ON ATV. NEEDED ONLY ONE ON ATV CANCELLED 312
Knarr	20-Apr-12	TIERNEY	WEST YELLOWSTONE	BISON ON POVAHS		1		MESSAGE FROM TIERNEY, CALL BACK WITH 31. WANTS 2 HORSEMAN, EXPLAIN 1 HORSE LAME, OTHER RESHOD ON MONDAY AND AVAIL. WILL HAVE MILLER COME OVER SAT. AND MONDAY W HORSE TO ASSIST. ALSO SMOLZ ON ATV.
Knarr	20-Apr-12	MILLER	WEST YELLOWSTONE	BISON ON POVAHS		1		CALL 313 WITH 31 AND ARRANGE MILLER TO WORK SAT. AND MONDAY
Smolczynski	20-Apr-12	povah	denny crk road	haze bison from south fork		1		Haze buffalo to Forest service
Knarr	21-Apr-12	BRIDGER	WEST YELLOWSTONE	BISON ON POVAHS		1		70+ BISON BACK ON POVAH'S. I WILL CALL SMOLZ AND MAKE SURE HE HELPS ON 22ND WITH ATV.
Knarr	21-Apr-12	SMOLZ	WEST YELLOWSTONE	BISON ON POVAHS		1		CALL TO SMOLZ ARRANGE ATV HELP IN MORNING
Smolczynski	22-Apr-12	state of montana	Hwy 287	Haze bison from Yellowstone Holi		1		Haze buffalo to Forest service
Knarr	23-Apr-12	SMOLZ	WEST YELLOWSTONE					CALL FOR UPDATE ON BISON, 100 ON WEST FORK, SOME ON 287. MILLER ON SEEN WITH HORSE, SMOLZ TO ALSO ASSIST
Knarr	23-Apr-12	LLOYD						GUN SMOKE BEING SHOED FOR BISON WORK.
Knarr	23-Apr-12	SHEPPARD						MEET WITH 31 REGARDING BISON. CONF, CALL AT 3PM
Miller	23-Apr-		West Yellowsto	assist DOL hazing bison				

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					26	172	63	
	12		ne					
Smolczynski	23-Apr-12	povah	denny crk road	haze bison from south fork		1		Haze buffalo to Forest service
Smolczynski	24-Apr-12	state of montana	Hwy 287	Haze bison from Yellowstone Holi		1		Haze buffalo to Forest service
Knarr	25-Apr-12	SMOLZ	WEST YELLOWSTONE			1		CALL FROM SMOLZ ON UPDATE
Smolczynski	25-Apr-12	povah	denny crk road	bison on southfork				No bison seen
Knarr	26-Apr-12							
Miller	26-Apr-12		West Yellowstone	assist DOL hazing bison				
Smolczynski	26-Apr-12	dol		bison on southfork				No bison seen
Knarr	29-Apr-12	BRIDGER	WEST YELLOWSTONE			1		40 BISON ON SOUTH FORK LOOKING FOR 2 RIDERS
Knarr	29-Apr-12	MILLER	WEST YELLOWSTONE			1		MESSG. TO MILLER AND CALL BACK FROM MILLER HE WILL ASSIST IN MORNING WITH HAZE.
Knarr	29-Apr-12	SMOLZ	WEST YELLOWSTONE			1		MESSG. TO SMOLZ TO ASSIST W HAZE IN A.M.
Knarr	30-Apr-12	BRIDGER	WEST YELLOWSTONE			1		PASSING ON MESSG. THAT THEY HAVE EXTRA HORSE IF NEEDED.
Knarr	30-Apr-12	SMOLZ	WEST YELLOWSTONE			1		CALL TO 32, CONFIRM HIS INVOLVMENT IN A.M. HAZE
Miller	30-Apr-12		West Yellowstone	assist DOL hazing bison				
	30-Apr-12	povah	denny crk road	bison on southfork		1		Haze bison Forest service
Knarr	1-May-12	GOSSE	WEST YELLOWSTONE	HAZING OPERATION		1		GOSSE COORDINATING WITH 32 FOR 05.01 HAZE
Knarr	1-May-12	SMOLZ	WEST YELLOWSTONE			1		HAZED 70 OFF SO. FORK ACROSS RIVER TO BUTTE, ASSISTED BY MILLER, ANDERSON, MOUNT, BRIDGER. WILL BE HAZING 70 ON HWY 287 WITH GOSSE TODAY.
Knarr	1-May-12	JONES	WEST YELLOWSTONE			1		UPDATE ON HAZES
Knarr	1-May-12	SMOLZ	WEST YELLOWSTONE			1		CALL FROM 32 BISON UPDATE, HERD ON SOUTH FORK SIDE
Smolczynski	1-May-12		wyelowstone	bison haze to park		1		Haze bison from horse butte to park

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					26	172	63	
Knarr	2-May-12	SMOLZ	WEST YELLOWS TONE			1		60 BISON MOVED OFF SOUTH FORK TO BAKERS HOLE. BISON STILL ON 287. WILL ASSIST ON NEXT DAY HAZE OF 287 BISON IF NEEDED.
Knarr	2-May-12	BRIDGER	WEST YELLOWS TONE			1		CALL TO BRIDGER HE IS LOOKING FOR HELP FOR BISON ON 287 HAZE IN MORNING
Knarr	2-May-12	MILLER	WEST YELLOWS TONE			1		MESSG. TO 313 TO ASSIST W HAZE NEXT DAY. TXT BACK WILL BE THERE TO HELP
Smolczynski	2-May-12		wyellowstone	bison haze to park		1		Haze bison from southfork to park
Knarr	3-May-12	MILLER	WEST YELLOWS TONE			1		TXT HE IS GOING TO BE LATE TO HAZE DO TO ACCIDENT ON ROAD. CONTACTED BRIDGER ABOUT BEING LATE.
Knarr	3-May-12	SHEPPARD	WEST YELLOWS TONE			1		UPDATE ON HAZES
Miller	3-May-12		West Yellowstone	assist DOL hazing bison				
Knarr	4-May-12	BRIDGER	WEST YELLOWS TONE			1		2100 CALL 4 BISON AT POVAH'S TOLD HIM I WOULD DOUBLE CHECK W 32 BUT DIDN'T THINK I HAD ANYONE ELSE AVAIL. ON SUCH SHORT NOTICE. CALL TO 32 VEH. REPAIR AND CPR CLASS NXT DAY NOT AVAILABLE.
Smolczynski	4-May-12	Loomis	Hwy 287	bison on property		1		None, bison are on forest service. Advise when haze will happen
Smolczynski	6-May-12	povah	deep well ranch	bison on property		1		Haze 34 bison to madison arm CG
Miller	7-May-12		West Yellowstone	assist DOL hazing bison				
Smolczynski	7-May-12	Southfork	wyellowstone	bison on southfork		1		Haze 77 bison to barns hole in park
Knarr	8-May-12	SHEPPARD				1		MEET W 31 GET UPDATE ON BISON HAZE SCHEDULE
Miller	8-May-12		West Yellowstone	assist DOL hazing bison				
Knarr	9-May-12	KNARR	WEST YELLOWS TONE			1		BIG HAZE IN WEST. 5 FWP WARDENS PRESENT. 4 HORSE 1 L.E. SUPPORT. 280 MOVED TO BARN'S HOLE IN PARK.
Miller	9-May-12		West Yellowstone	assist DOL hazing bison				
Smolczynski	9-May-12	galanis	horsebutte	bison on horse butte		1		Haze 100+ bison from horse butte
Miller	10-May-12		West Yellowstone	assist DOL hazing bison				
Smolczynski	10-May-12	red canyon	wyellowstone	bison on private property		1		Haze 43 bison from 287 to cougar creek in park
Miller	11-		West	assist DOL hazing bison				

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					26	172	63	
	May -12		Yellowstone					
Knarr	14-May -12	BRIDGER	WEST YELLOWS TONE			1		REQUEST FOR RIDERS ON TUESDAY. WILL CALL BACK
Knarr	14-May -12	SHEPPARD	WEST YELLOWS TONE			1		DISCUSS BISON HAZE
Knarr	14-May -12	MILLER	WEST YELLOWS TONE			1		LINE UP 313 TO RIDE 2MARO MAY15
Knarr	14-May -12	SMOLZ	WEST YELLOWS TONE			1		DISCUSS BISON HAZE, 32 IS HAZING TODAY AND WILL HAZE TUE. AND REST OF WEEK.
Knarr	14-May -12	KLINE	WEST YELLOWS TONE			1		DISCUSS BISON HAZE HELP FOR WEN. AND THU.
Sheppard	14-May -12	Nancy Gruehl	Gardiner	bison fencing			1	called her to let her know about the meeting on Wed with the NGO groups regarding fencing, we will stop by her house.
Sheppard	14-May -12	Nancy Gruehl	Gardiner	bison fencing			1	called her to let her know about the meeting on Wed with the NGO groups regarding fencing, we will stop by her house.
Smolczynski	14-May -12	Southfork	wyellowstone	bison on southfork		1		Haze bison off south fork to CG
Knarr	15-May -12	KNARR	WEST YELLOWS TONE			1		HAZE 80 BISON FROM BUTTE BACK TO BEHIND 32'S. ASSIST WITH HAZE OF 30 ON RIM ROAD, DROP THEM INTO LAKE BECAUSE OF HEAT AND DANGER
Knarr	15-May -12	KLINE	WEST YELLOWS TONE			1		CALL TO COY ON HAZE
Miller	15-May -12		West Yellowstone	assist DOL hazing bison				
Sheppard	15-May -12	Nancy Gruehl	1075 Hwy 89 Gardiner	bison fencing			1	confirmed meeting time and date with NGO groups on strategic fencing
Sheppard	15-May -12	Norman Milman	223 0040 Gardiner	wants reimbursement for the fence he built			1	informed him of the meeting with the NGO, told him I would present his information to the NGO's that it would be their decision as to whether he will be reimbursed
Sheppard	15-May -12	Nancy Gruehl	1075 Hwy 89 Gardiner	questions regarding tomorrow's meeting			1	let her know she is more than welcome to ask or discuss any aspect of bison in the Gardiner Basin with the NGO groups
Smolczynski	15-May -12	Southfork	wyellowstone	bison on southfork		1		Haze bison off south fork to park
Knarr	16-May -12	SMOLZ	WEST YELLOWS TONE			1		CALL FROM 32 ON HAZE UPDATE.
Knarr	16-May -12	KNARR AND SHEPPARD	GARDINER			1		TRAVEL TO GARDINER WITH 31 MEET WITH NGO'S ON FENCING PROJECTS
Miller	16-May -12		West Yellowstone	assist DOL hazing bison				
Sheppard	16-May	Nancy Gruehl/Nor	Gardiner basin field	Strategic fencing efforts and NGO work	1		1	Met with NGO in Gardiner field tour

Table B1.—Log of incidents responded to by MFWP Wardens from Nov 2011 through Aug 2012.

Officer	Date	Landowner or Contact	Address	Concern	Public Safety (PS), Hazing (H), Property Damage (PD)			Action Taken
					PS 26	H 172	PD 63	
	-12	man Milman/NGO	tour					
Smolczynski	16-May-12	povah	deep well ranch	bison on private property		1		Haze 56 bison from southfk to barns hole in park
Knarr	17-May-12	KLINE	WEST YELLOWSTONE			1		CALL BACK TO COY ABOUT PREVIOUS DAYS HAZE
Knarr	17-May-12	TIERNEY	WEST YELLOWSTONE			1		CALL FROM TIERNERY FORM 2 RIDERS ON FRIDAY
Knarr	17-May-12	MILLER	WEST YELLOWSTONE			1		CALL TO 313 TO SET UP HAZE ASSIST ON FRIDAY
Knarr	17-May-12	SMOLZ	WEST YELLOWSTONE			1		CALL FROM 32 ABOUT HAZE ON FRIDAY
Smolczynski	17-May-12	galanis	horsebutte	bison on private property		1		haze 101 bison from horse butte to 7 mile bridge in park
Miller	18-May-12		West Yellowstone	assist DOL hazing bison				
Smolczynski	18-May-12	Hwy 287	wyellowstone	bison on private property		1		Haze 29 bison from 287 to cougar creek in park
Knarr	19-May-12	SMOLZ	WEST YELLOWSTONE			1		CALL FROM 32 BISON UPDATE
Smolczynski	20-May-12	forest service	wyellowstone	bison calf separated from mom	1			Put calf back in with a herd
Knarr	21-May-12	SMOLZ	WEST YELLOWSTONE			1		CALL FROM 32 HAZING 20 OFF POVAH'S WITH BRIDGER
Smolczynski	21-May-12	forest service	wyellowstone	bison on southfork		1		Haze bison from southfork to park
Knarr	22-May-12	WILLIAMS	WEST YELLOWSTONE			1		VISIT W/312 REGARDING DAYS HAZING, BISON TAKEN OFF SOUTH FORK ACROSS RIVER INTO PARK THEN UNHAZABLE
Knarr	22-May-12	FLOWERS	WEST YELLOWSTONE			1		UPDATE ON HAZES
Smolczynski	22-May-12	hwy 287	wyellowstone	bison on private property		1		Haze bison from 287 to cougar creek in park
Miller	23-May-12		West Yellowstone	assist DOL hazing bison				
Smolczynski	23-May-12	forest service	wyellowstone	bison on southfork		1		Haze bison from southfork to park
Knarr	24-May-12	TIERNEY	WEST YELLOWSTONE	USE OF FWP VEHICLES TO TRANSPORT BISON BACK INTO PARK				CALL FROM ROB REGARDING USE OF FWP TRAILER TO MOVE TRAPPED BISON INTO PARK
Knarr	24-May-12	SHEPPARD / FLOWERS	WEST YELLOWSTONE			1		MESSG. TO GET DIRECTION ON MOVING BISON WITH FWP TRAILER

Table B1.—Log of incidents responded to by MFWP Wardens from Nov 2011 through Aug 2012.

Public Safety (PS), Hazing (H), Property Damage (PD)								
Officer	Date	Landowner or Contact	Address	Concern	PS	H	PD	Action Taken
					26	172	63	
Knarr	24-May-12	TIERNEY	WEST YELLOWS TONE			1		SPEAK TO ROB, ROB SAID CHRISTIEN CALLED FWP DIRECTORS OFFICE AND GOT APPROVAL TO USE FWP VEHICLES.
Knarr	24-May-12	SMOLZ	WEST YELLOWS TONE			1		CALL FROM 32 ALL WENT WELL WITH MOVE OF BISON BACK INTO PARK
Miller	24-May-12		West Yellowstone	assist DOL hazing bison				
Smolczynski	24-May-12	kelser	wyellowstone	haze and capture bison		1		Haze bison and trap, ship to park
Smolczynski	25-May-12	forest service	wyellowstone	haze bison on southfork		1		Haze bison from mad arm to park
Knarr	28-May-12	BRIDGER	WEST YELLOWS TONE			1		REQUEST FOR ASST. ON 29-31 WILL SET UP RIDERS
Knarr	28-May-12	SMOLZ	WEST YELLOWS TONE			1		MESSG TO ASST. 29-31
Knarr	28-May-12	MILLER	WEST YELLOWS TONE			1		MESSG TO ASST. 30 AND 31
Knarr	29-May-12	MILLER	WEST YELLOWS TONE			1		CALLS TO CONFIRM ASST. ON 30 AND 31
Smolczynski	29-May-12	forest service	wyellowstone	haze bison on butte		1		Haze bison from horse butte to park
Miller	30-May-12		West Yellowstone	assist DOL hazing bison				
Smolczynski	30-May-12	Southfork	wyellowstone	haze bison on private land		1		Haze bison from southfork to park
Knarr	31-May-12	SMOLZ	WEST YELLOWS TONE			1		HAZING 200 BACK FARTHER INTO PARK TODAY. MOVED TO BAKER HOLE YESTERDAY.
Miller	31-May-12		West Yellowstone	assist DOL hazing bison				
Smolczynski	31-May-12	povah	wyellowstone	haze bison on private land				Haze bison from south to park
Knarr	1-Jun-12	SMOLZ/MILLER	WEST YELLOWS TONE			1		MESSG. TO CHECK ON HAZING OP.
Miller	1-Jun-12		West Yellowstone	assist DOL hazing bison				
Smolczynski	1-Jun-12	whitman	wyellowstone	bison haze to park		1		Haze bison from 287 to 7 mile bridge
Knarr	2-Jun-12	SMOLZ	WEST YELLOWS TONE			1		38 HAZED 5 BACK TO COUGAR MEADOW ON 1ST.
Knarr	3-Jun-12	BRIDGER	WEST YELLOWS TONE	2 BISON ON POVAH'S AND 20 OR SO ON BUTTE		1		REQUEST FOR RIDERS ON 4 AND 5TH NOT POSSIBLE B/C OF MADITORY D.T. TRAINING. UNDERSTAND DOL IS ALSO UNDER STAFFED FOR

Table B1.—Log of incidents responded to by MFWP Wardens from Nov 2011 through Aug 2012.

Officer	Date	Landowner or Contact	Address	Concern	Public Safety (PS), Hazing (H), Property Damage (PD)			Action Taken
					PS 26	H 172	PD 63	
								THESE DATES.
Knarr	4-Jun-12	SMOLZ	WEST YELLOWS TONE			1		DISCUSSIONS WITH 32 AND 31 ABOUT HAZING. NO WORD FROM DOL
Knarr	5-Jun-12	SMOLZ	WEST YELLOWS TONE			1		TALK TO 32 ABOUT HAZE. NO CALLS FROM DOL
Knarr	6-Jun-12	SMOLZ	WEST YELLOWS TONE			1		TALK TO 32 ABOUT HAZE. NO CALLS FROM DOL
Knarr	10-Jun-12	M. ANDERSON	WEST YELLOWS TONE			1		CALL FROM M.A. REGARDING RIDERS TO MOVE BISON OUT OF VILLAGE AREA ON 11TH.
Knarr	10-Jun-12	SMOLZ	WEST YELL			1		CALL TO 32 TO ASSIST WITH HAVE OUT OF VILLAGE ON 11TH.
Knarr	10-Jun-12	M. ANDERSON	WEST YELLOWS TONE			1		C/B TO M.A. ABOUT 32 ASSIST
Knarr	10-Jun-12	SHEPPARD	WEST YELLOWS TONE			1		CALL TO 31 REGARDING HAZE ON 11TH.
Smolczynski	11-Jun-12	287	wyellowstone	bison haze to park		1		Haze bison from 287 to 7 mile bridge
Knarr	13-Jun-12	I. PARKER S.O.	WEST YELLOWS TONE			1		MESSG. FROM PARKER ABOUT BISON DAMAGE COMPLAINT. HE DID GET A HOLD OF SMOLZ. REGARDING COMPLAINT
Knarr	15-Jun-12	M. ANDERSON	WEST YELLOWS TONE			1		VISIT WITH ANDERSON CONCERNING BISON OUT IN WEST YELLOWSTONE, 2 BULLS NEAR HOLIDAY INN HWY287, 3 MORE OFF 287 AND 20+ ON BUTTE.
Knarr	17-Jun-12	BRIDGER	WEST YELLOWS TONE			1		
Knarr	17-Jun-12	SMOLZ	WEST YELLOWS TONE			1		32 WILL PULL HORSES OFF PASTURE AND HAVE READY FOR TUE. HAZE
Knarr	18-Jun-12	SMOLZ	WEST YELLOWS TONE			1		SET UP TO HAZE TUES.
Knarr	18-Jun-12	GOSSE	WEST YELLOWS TONE			1		SET UP TO HAZE TUES.
Knarr	19-Jun-12	SMOLZ	WEST YELLOWS TONE			1		32 NOT AVAIL. AND NO REQUEST TO HAZE
Knarr	19-Jun-12	BRIDGER	WEST YELLOWS TONE			1		REQST. FROM BRIDGER FOR RIDER ON THURS.
Knarr	19-Jun-12	SMOLZ	WEST YELLOWS TONE			1		MESSG. TO 32 ABOUT THU. HAZE
Knarr	19-Jun-12	SMOLZ	WEST YELLOWS TONE			1		LATE CALL BACK FROM 32 APPT. IN AFTERNOON ON THU. NOT AVAIL TO ASSIST

Table B1.—Log of incidents responded to by MFWP Wardens from Nov 2011 through Aug 2012.

Public Safety (PS), Hazing (H), Property Damage (PD)								
Officer	Date	Landowner or Contact	Address	Concern	PS	H	PD	Action Taken
					26	172	63	
Knarr	19-Jun-12	BRIDGER	WEST YELLOWSTONE			1		MESSG. TO BRIDGER NO RIDERS AVAIL. FOR THU. HAZE
Smolczynski	19-Jun-12	carters	wyellowstone	bison haze to butte	1			Haze bison from 287 to horse butte
Knarr	20-Jun-12	SHEPPARD	WEST YELLOWSTONE			1		UPDATE NO RIDERS ON THU. HAZE.
Smolczynski	23-Jun-12	roseanne arnson	wyellowstone	buffalo on lawn	1			call and talk about a possible haze
Sheppard	2-Jul-12	Florence Zundel (chamber)	Cooke city	1 bull bison destroying trees	1		1	Talked with her about bison safety and behavior. Suggested fencing options, committed to wire panels to protect trees.
Sheppard	3-Jul-12	Florence Zundel (chamber)	Cooke city				1	delivered 12 panels to protect trees from bison
Knarr	8-Jul-12				1			WENT TO GARDINER WITH 31 TO EVAL BUS STOP GUARDS, AND CHECK OUT HATFIELD/PETERS FENCE
Sheppard	18-Jul-12	Norman Millman	gardiner					discussed NGO reimbursement of \$250.00 for fencing e-mailed w9 with contact info.
Sheppard	18-Jul-12	Nancy Gruehl	1075 hwy 89 gardiner					Left message about NGO reimbursement \$250.00 for fencing mailed w-9 with contact information
Sheppard	18-Jul-12	DOL: Dee Hall	Pine needle rd West Yellowstone	upset about chronicle article "HB owners welcome bison" 11 bison in her yard and she is upset			1	talked with Smolz he is headed out to her house now, to address situation. Instructed smolz to advise her of upcoming EA and comment period and assist her with bison on property
Sheppard	22-Aug-12	Warren Wagner	1047 Hwy 89 Gardiner	interested in bison fencing program				put him in touch with Zach Waterman from Sierra Club, discussed his issues and potential fixes, let him know to call us at FWP if he has public safety or property damage this winter
Sheppard	22-Aug-12	Warren Wagner	1047 Hwy 89 Gardiner	wants information about bison fencing program				put him in touch with Zach Waterman of Sierra Club, provided details about program. Asked him to call fwp if he had any property damage or public safety concerns this winter.
Sheppard	23-Aug-12	Pat Povah	West Yellowstone	wants information about bison fencing program also concerned about damage to low land flats				gave him information to contact Zack Waterman about fencing.
Knarr	no date recorded	SMOLZ	WEST YELLOWSTONE			1		MESSG. FROM SMOLZ. HAZE DONE BY 1130 DO TO LACK OF BISON ON SOUTH SIDE.
Knarr	no date recorded							message from Bridge about haze on Monday and tues. Left him message that our horses not available until tues.
Scott	no date recorded			patrolled tribal hunt/no one checked				

Appendix C: Status of Gallatin National Forest Grazing Allotments⁴

Table C1.—Status of Gallatin National Forest Grazing Allotments

Allotment Name	Location	Status	Class and Number of Livestock	On-Off Dates	Changes
West of Park					
Watkins Creek	West of Hebgen Lake	Active	51 cow/calf pairs	7/1-9/30	
South Fork	South of Hebgen Lake	Active	19 cow/calf pairs	7/1-9/30	
Basin	South of Hebgen Lake	Active	10 cow/calf pairs	7/21-9/19	Non - use in 2012
Sulphur Springs	South of Hebgen lake and Hwy 20	Vacant	10 horses	7/1-9/30	Changed from cattle to horses
Wapiti	Taylor Fork	Vacant	160 cow/calf pairs (2 permittees)	7/11-10/10	Permit waived to FS
Cache-Eldridge	Taylor Fork	Vacant	154 cow/calf pairs	7/1-10/15	Permit waived to FS
Red Canyon	North of Horse Butte, North of Hwy 287	Vacant	cow/calf pairs		
Duck Creek	East of Hebgen Lake	Closed	cow/calf pairs		Status changed from vacant to closed
Dry Gulch	Northeast of Horse Butte, North of Hwy 287	Closed	cow/calf pairs		Status changed from vacant to closed
Horse Butte	East of Hebgen Lake	Closed (2009)	cow/calf pairs		
University	Taylor Fork	Closed	sheep		Status changed from vacant to closed
Sheep Mile	S. of Quake Lake	Active	89 yearlings	6/20-10/20	Non - use in 2012
Two Top	Hebgen Lake	Closed	Used to be sheep		Status changed from vacant to closed
Lionhead	Hebgen Lake	Closed	Used to be sheep		Status changed from vacant to closed
North of Park					
Tom Miner and Ramshorn		Active (combined allotments)	126 cow/calf pairs 134 pvt land permit	7/1-10/15	
Horse Creek and Reeder Creek	Upper Tom Miner	Active (combined allotments)	78 cow/calf pairs 30 horses	7/1-9/30	
Mill Creek and Section 22	Upper Cinnebar and Upper Mulherin	Vacant	36 cow/calf pairs	6/16-10/15	Permit waived to FS
Green Lake		Active	46 cow/calf pairs	6/16-10/15	Change from 2 permittees to 1, permittee waived permit to

⁴ USFS personnel noted that the 2011 IBMP Annual Report lists Horse Butte as vacant; however that allotment was officially closed in November 2009.

Table C1.—Status of Gallatin National Forest Grazing Allotments

Allotment Name	Location	Status	Class and Number of Livestock	On-Off Dates	Changes
					FS
Wigwam		Active	56 cow/calf pairs	6/16-9/30	
Slip and Slide	East side of Yellowstone River	Active	47 cow/calf pairs, one permit vacant	6/16-10/15	Non - use in 2012
Canyon		Closed	cow/calf pairs		Status changed from vacant to closed
Cottonwood		Vacant	cow/calf pairs		
Lion Creek		Vacant	cow/calf pairs		
Park		Closed	cow/calf pairs		Status changed from vacant to closed
Sentinel Butte		Closed	cow/calf pairs		Status changed from vacant to closed

Appendix D: Environmental data for the Madison Valley during May and June of 2012

Table D1.—Environmental data for the Madison Valley during May and June of 2012. Shaded boxes in the air temperature column indicate nights when the minimum temperature was below freezing. Shaded boxes in the Madison River discharge column indicate days when the river reached flood stage. Growing Degree Days is a temperature equation that represents relative rate of growth in plant community.

Date	Snow Water Equivalent (Year-to-date accumulation in inches)	Snow Depth (inches)	Precipitation Year-to-date (inches)	Air Temperature Degrees C		Growing Degree Days (Temperature units)	Madison River Discharge (cfs)
				Max	Min		
05-01	0.0	0.0	20.7	10.56	0.00	5.45	818
05-02	0.0	0.0	20.8	8.33	-1.11	3.4	789
05-03	0.0	0.0	20.8	10.56	-1.11	4.95	733
05-04	0.0	0.0	20.9	11.11	0.56	6.05	706
05-05	0.0	0.0	21	13.89	-0.56	6.65	751
05-06	0.0	0.0	21.1	6.67	-2.78	1.95	715
05-07	0.0	0.0	21.1	9.44	-5.00	2.35	679
05-08	0.0	0.0	21.1	16.11	-6.67	4.65	679
05-09	0.0	0.0	21.1	19.44	-4.44	7.25	770
05-10	0.0	0.0	21.1	21.67	-1.67	9.95	929
05-11	0.0	0.0	21.1	12.78	2.22	7.3	848
05-12	0.0	0.0	21.1	13.89	-2.78	5.65	848
05-13	0.0	0.0	21.1	18.33	-5.56	6.3	888
05-14	0.0	0.0	21.1	21.67	-5.00	8.45	950
05-15	0.0	0.0	21.1	23.89	-2.78	10.6	1020
05-16	0.0	0.0	21.1	26.11	-2.22	11.9	1000

Table D1.—Environmental data for the Madison Valley during May and June of 2012. Shaded boxes in the air temperature column indicate nights when the minimum temperature was below freezing. Shaded boxes in the Madison River discharge column indicate days when the river reached flood stage. Growing Degree Days is a temperature equation that represents relative rate of growth in plant community.

Date	Snow Water Equivalent (Year-to-date accumulation in inches)	Snow Depth (inches)	Precipitation Year-to-date (inches)	Air Temperature Degrees C		Growing Degree Days (Temperature units)	Madison River Discharge (cfs)
				Max	Min		
05-17	0.0	0.0	21.1	25.00	0.00	12.35	1040
05-18	0.0	0.0	21.2	19.44	0.56	9.85	992
05-19	0.0	0.0	21.4	10.56	-1.11	4.65	908
05-20	0.0	0.0	21.4	16.11	-3.33	6.3	848
05-21	0.0	0.0	21.4	20.56	-2.22	9.1	838
05-22	0.0	0.0	21.4	24.44	-1.11	11.5	867
05-23	0.0	0.0	22	16.67	0.00	8.3	992
05-24	0.0	0.0	22	9.44	0.00	4.7	908
05-25	0.0	0.0	22.2	9.44	-2.22	3.45	818
05-26	0.1	2.0	22.9	4.44	-2.22	0.85	828
05-27	0.0	0.0	23.4	11.11	0.56	6	1000
05-28	0.0	0.0	23.4	8.89	1.67	5.05	848
05-29	0.0	0.0	23.4	12.78	-1.11	5.7	799
05-30	0.0	0.0	23.4	18.33	-2.78	7.85	770
05-31	0.0	0.0	23.4	17.22	3.33	10.35	742
06-01	0.0	0.0	23.4	18.33	0.00	9.25	761
06-02	0.0	0.0	23.4	22.22	4.44	13.35	789
06-03	0.0	0.0	23.8	22.22	1.11	11.75	848
06-04	0.0	0.0	23.8	23.33	6.67	15.1	848
06-05	0.0	0.0	23.8	28.33	4.44	16.35	838
06-06	0.0	0.0	23.8	22.78	1.67	12.35	857
06-07	0.0	0.0	23.9	11.11	-1.67	4.55	761
06-08	0.0	0.0	23.9	18.33	-4.44	7.05	697
06-09	0.0	0.0	24.6	18.33	0.56	9.55	898
06-10	0.0	0.0	24.6	12.78	0.56	6.55	857
06-11	0.0	0.0	24.8	10.56	0.56	5.4	761
06-12	0.0	0.0	24.8	18.33	-1.11	8.4	688
06-13	0.0	0.0	24.9	21.11	-1.67	9.6	670
06-14	0.0	0.0	25.1	19.44	2.78	10.9	697
06-15	0.0	0.0	25.1	19.44	-1.11	9.25	670
06-16	0.0	0.0	25.1	20.56	-1.67	9.4	640
06-17	0.0	0.0	25.1	22.22	-1.11	10.6	630
06-18	0.0	0.0	25.1	24.44	6.67	15.6	621
06-19	0.0	0.0	25.1	21.11	1.67	11.4	611
06-20	0.0	0.0	25.1	14.44	-0.56	7.05	592
06-21	0.0	0.0	25.1	18.89	0.56	9.65	564
06-22	0.0	0.0	25.1	24.44	-2.22	11.15	564
06-23	0.0	0.0	25.1	27.78	1.67	14.7	555
06-24	0.0	0.0	25.1	27.78	2.22	14.95	537
06-25	0.0	0.0	25.1	30.56	1.67	16.1	529
06-26	0.0	0.0	25.1	28.89	3.89	16.45	511

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Date	Snow Water Equivalent (Year-to-date accumulation in inches)	Snow Depth (inches)	Precipitation Year-to-date (inches)	Air Temperature Degrees C		Growing Degree Days (Temperature units)	Madison River Discharge (cfs)
				Max	Min		
06-27	0.0	0.0	25.1	22.22	1.11	11.6	511
06-28	0.0	0.0	25.1	22.78	-1.11	10.8	503
06-29	0.0	0.0	25.1	28.33	-1.11	13.6	494
06-30	0.0	0.0	25.1	27.78	2.22	14.95	486